MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XXV

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VERBENA SESSILIS (Cham.) Kuntze

Kuntze (1898) continues: "Schauer in DC. prod. und Flora brasiliensis stellt noch ex descr. eine dritte Art: V. montevidensis Spr. dazu, die aber nach dem Original-Exemplar gar keine Aehnlichkeit hat. Bei V. decurrens und sessilis sind die kopfigen Inflorescenzen sehr dicht, oben zur Blüthezeit fast flach, 2 cm breit und verjüngen sie keilig nach unten: die Bracteen sind flach, aufrecht, 1--1 1/2 cm lang in eine lange Spitze auslaufend und langhaarig gewimpert; die schlanke Corollenröhre steht 1 cm lang aus dem Kelch hervor; die Blätter sind lineallanzettig (1: 8--16) und bis 8 cm lang. Bei V. montevidensis Spr. sind die kopfigen Inflorescenzen locker und mehr oblong ährenartig, nur 3-5 mm breit, die Bracteen sind kahnförmig oval acut abstehend, kaum 2 mm lang, nicht gewimpert; die breite Corollenröhre überragt den Kelch kaum; die Blätter sind oval bis breitlanzettig (1: 1 1/2--2 1/2) nur 1/2--1 1/2 cm lang."

Verbena sessilis inhabits swamps and swampy meadows, wet soil and wet sand, grassy fields, shrubby campos, and wet tallgrass campos, and is found along rivers and highways. Jörgensen calls it "common". It has been collected in anthesis in January, March, May, September, and November. Rosengurtt (1943) describes it as "Hemicriptófita, florece a fines de primavera y verano. Habita en los bañados, siendo rara" and cites his B.2351, OH. 18494, and OH.18495. Schnack & Covas (1946) also cite Rosengurtt B.2351 (Si), while Briquet (1904) cites Regnell A.2039 from Paraguay.

Schauer (1847) describes our plant as "foliis sessilibus anguste lanceolatis obsolete serratis facie strigilis subtilibus conspersis, bracteis calyce nonnihil brevioribus". Chamisso's original description is "β) sessilis foliis sessilibus lanceolatis obsolete serrulatis supra pagina strigulosis. E Brasilia meridionali utramque varietatem misit Sellowius." Although these authors agree that V. sessilis differs from V. stellarioides in having its leaves merely sessile, not decurrent, narrow-lanceolate, obsoletely serrate, sparsely strigillose, and the bractlets shorter than the calyx, it seems to me that the length of the bractlets is the only dependable character for separating the two taxa.

Herbarium specimens of V. sessilis have been misidentified and widely distributed as V. stellarioides Cham. On the other hand, the following specimens were distributed or cited by me previously as V. sessilis, but are actually V. stellarioides: Jörgensen 3773 [Herb. Osten 22241], Kuntze s.n., Morong 600, T. Rojas 1680 [Herb. Hassler 1680; Herb. Osten 8641] & 2527, and A. G. Schulz 285 [Herb.

Osten 23149] & 1468.

In all, 30 herbarium specimens and 5 mounted photographs, including the types or phototypes of all the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Rambo 25786 (N). State undetermined: Sellow 1563 [Macbride photos 17447] (Kr--photo of type, N--photo of type, N--photo of type). PARAGUAY: Fiebrig 4031 (Bm, V); Hassler 2478 (Bm, V), 2478a (Bm, Cb, N--photo, V, Z--photo); Kuntze s.n. [Nord Paraguay, IX.92] (W--701065); Lindman A.2039 (S, S); Malme 928 (N, S, S); T. Rojas 174 (S). URUGUAY: Arechavaleta 19 (Ug, Ug), 3135, in part (Ug), s.n. [Herb. Osten 18494] (Ug); Berro 6721 (N), 7477 (N); Gallinal 742 [Herb. Osten 23356] (Ug); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt A.1110 (N); Herter s.n. [Herb. Osten 18494] (Ug), s.n. [Herb. Osten 18495] (N, Ug, Ug). ARGENTINA: Formosa: Jörgensen 2477 [Herb. Osten 1367] (Ug, W--1055184); I. Morel 1707 (N).

VERBENA SETACEA Perry, Ann. Mo. Bot. Gard. 20: 339--340, pl. 15. 1933.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 249, 250, 312, 339--340, 356, & 362, pl. 15. 1933; A. W. Hill, Ind. Kew. Suppl. 9: 295. 1938; Worsdell, Ind. Lond. Suppl. 2: 486. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 102. 1942; Moldenke, Alph. List Cit. 2: 467 (1948) and 3: 833. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 199. 1949; Moldenke, Résumé 40 & 474. 1959; Moldenke, Phytologia 9: 176 & 177. 1963; Moldenke in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1246. 1964.

Illustrations: Perry, Ann. Mo. Bot. Gard. 20: pl. 15. 1933.

Herbaceous or suffruticose at the base; stems decumbent or decumbent-ascending, branched, soft-pubescent; branches ascending, pilose-pubescent; leaves decussate-opposite, petiolate; leaf-blades 3--5 cm. long, cuneate-truncate at the base and narrowed into the margined petiole, trifid, softly villous-pubescent on both surfaces, the segments coarsely dentate, the lateral lobes small, the vein reticulation somewhat prominent beneath; spikes short-pedunculate; bractlets linear-lanceolate, about 3/4 as long as the calyx, soft-pubescent, ciliate, subulate-setaceous at the apex; calyx about 6 mm. long, villous-pubescent, its teeth 2 mm. long, about half as long as the tube, subulate-setaceous; corolla-tube about 7 mm. long, pubescent outside, the limb 6--7 mm. wide; anthers not glandular; mature cocci not known.

The type of this rare species was collected by Carl Albert Purpus (no. 195) among rocks, at an altitude of 1600--1700 feet, at Calmallí, Baja California, Mexico, between January and March, 1898, and is deposited in the herbarium of Pomona College at Claremont, California. The species is known thus far only from the type collection and was originally misidentified and distributed as V. ciliata Benth. Perry (1933) says "The gross habit of this plant is very like that of V. Gooddingii var. nepetifolia. Unfortunately the inflorescence is immature and only a few flowers are in anthesis, hence it is rather difficult to say what are the characters of the spike or of the mature nutlets. Moreover, the corolla may be larger than appears in this specimen. The flower itself is similar to that of V. lilacina, but the two plants are so different in habit it would seem as if this were perhaps only a superficial resemblance. The species is readily distinguished by its general habit and long setaceous calyx-teeth."

Only one herbarium specimen and 3 mounted illustrations and clippings, including the type, have been examined by me.

Citations: MEXICO: Baja California: Purpus 195 (N--photo of type, Po--63919--type, Z--photo of type). MOUNTED CLIPPINGS: Perry, Ann. Mo. Bot. Gard. 20: 362, pl. 15. 1933 (W).

VERBENA SHREVEI Moldenke, Phytologia 2: 26--27. 1941.

Bibliography: Moldenke, Phytologia 2: 26--27. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 102. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 83. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 199. 1949; Moldenke, Alph. List Cit. 3: 933 (1949) and 4: 1244. 1949; Shreve & Wiggins, Carnegie Inst. Wash. Publ. 591: 127. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 40 & 474. 1959; Moldenke, Phytologia 8: 196. 1962; Moldenke in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1246. 1964; Moldenke, Phytologia 10: 306. 1964.

Annual herb; stems decumbent at the base, slender, obtusely tetragonal, more or less densely spreading-pubescent with whitish often glandular hairs, often many-branched with erect or ascending branches, which are usually somewhat more densely spreading-pubescent; leaves decussate-opposite, petiolate or the uppermost subsessile; petioles very slender, 1--10 mm. long, more or less winged, densely hirsutulous or spreading-pubescent; leaf-blades chartaceous, rather uniformly green on both surfaces, elliptic in outline, 1--2 cm. long, 9--17 mm. wide, rather densely strigose on both surfaces, usually more or less 3-parted, the divisions sparingly incised-lobed, the lobes rounded at the apex; inflorescence spicate, elongating to 10 cm. or more, densely many-flowered, the rachis elongating even during anthesis and thus separating the individual flowers by 4--13 mm. toward the base of the spike; peduncles 1--4 cm. long, slender, obtusely tetragonal, densely spreading-pubescent or hirsutulous with whitish often glandular hairs; rachis similar to the peduncle in all respects; bractlets lanceolate, about 4 mm. long, shorter than the calyx, attenuate at the apex, densely glandular-pubescent on the back, densely long-ciliate with longer stiff white non-glandular hairs on the margins; calyx tubular, 5--6 mm. long, rather densely glandular-pubescent and also more or less scattered white-hirsutulous; corolla small, 7--8 mm. long, slightly projecting from the calyx, its tube minutely puberulent at the apex outside, the limb about 4 mm. wide.

The type of this species was collected by Forrest Shreve (no. 7119) -- in whose honor it is named -- at an elevation of 1900 feet, 19 miles northeast of Comondón [=Comondú], Baja California, Mexico, on March 16, 1935, and is deposited in his herbarium at Tucson, Arizona. Material of this species has also been found on volcanic mesas. Herbarium material has been misidentified and distributed under the names V. ciliata Benth., V. gooddingii Briq., and V. pumila Rydb. It is known thus far only from the type locality. In all, 5 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: MEXICO: Baja California: H. C. Orcutt s.n. [Pinery, 10-6-1882] (Mi); Shreve 7119 (Du--265832--isotype, Fs--type, Mi--isotype, N--isotype, N--photo of type, Z--photo of type).

VERBENA SIMPLEX Lehm., Nov. Act. K. Deut. Akad. Naturf. Halle 14 (2): 524. 1825; Ind. Sem. Hort. Hamb. 17. 1825.

Synonymy: Verbena angustifolia Michx., Fl. Bor.-Am. 2: 14. 1803 [not V. angustifolia Mill., 1768, nor Lam., 1947]. Verbena rugosa Muhl. ex Willd., Enum. Hort. Berol. 2: 633. 1809 [not V. rugosa D. Don, 1836, nor Michx., 1947, nor Mill., 1768, nor Sweet, 1845]. Verbena integrifolia Michx. ex Hook., Comp. Bot. Mag. 1: 176. 1836 [not V. integrifolia Sessé & Moc., 1889]. Verbena rugosa Willd. ex Hook., Comp. Bot. Mag. 1: 176, in syn. 1836. Verbena angustata Michx. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena angustifolia L. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena anusifolia Michx. ex G. L. Fisher, Am. Bot. Exchange List, sphalm. 1946. Verbena langustifolia Warne ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947. Verbena cuneifolia Wallberg ex Moldenke, Résumé 363, in syn. 1959 [not V. cuneifolia Hort., 1845, nor Raf., 1808, nor Ruíz & Pav., 1798]. Verbena angustifolium Michx. ex Moldenke, Résumé Suppl. 4: 14, in syn. 1962. Verbena angustifola Mx. ex Moldenke, Résumé Suppl. 11: 8, in syn. 1964.

Bibliography: Mill., Gard. Dict., ed. 8, no. 15. 1768; Michx., Fl. Bor.-Am., ed. 1, 2: 14. 1803; Poir. in Lam., Encycl. Méth. Bot. 8: 549. 1808; Willd., Enum. Hort. Berol. 2: 633. 1809; Pursh, Fl. Am. Sept. 2: 417. 1814; J. Sm. in Rees, Cycl. 36: no. 7. 1817; Michx., Fl. Bor.-Am., ed. 2, 1 [=2]: 14. 1820; Spreng. in L., Syst. Veg., ed. 16, 2: 747. 1825; Lehm., Nov. Act. K. Deut. Akad. Naturf. Halle 14 (2): 524. 1825; Lehm., Ind. Sem. Hort. Hamb. 17. 1825; Lehm., Del. Sem. Hort. Hamb. 1826: 16. 1826; Lehm., Nov. & Minus Cog. Stirp. Pug. 1: 37. 1828; Lehm., Nov. Act. Acad. Caes. Leopold. 14: 824. 1828; Sweet, Hort. Brit., ed. 2, 418. 1830; Hook., Comp. Bot. Mag. 1: 176. 1836; Eaton & Wright, N. Am. Bot., ed. 8, 470. 1840; Steud., Nom. Bot., ed. 2, 2: 749 & 750. 1841; J. Torr., Fl. State N. Y. 2: 53 & 570. 1843; D. Dietr., Syn. Pl. 3: 600. 1843; Walp., Repert. 4: 13, 18, & 32. 1845; Schau. in A. DC., Prodr. 11: 545. 1847; A. W. Chapm., Fl. South. U. S., ed. 1, pr. 1, 307. 1860; Bocq., Adansonia 2: 113. 1861-1862; Bocq., Rev. Verbenac. 33. 1862; A. W. Chapm., Fl. South. U. S., ed. 1, pr. 2, 307 (1865) and pr. 3, 307. 1872; A. Gray, Syn. Fl. N. Am. 2 (1): 336. 1878; Pickering, Chron. Hist. Pl. 1041 & 1220. 1879; A. W. Chapm., Fl. South. U. S., ed. 2, pr. 1, 307 (1884), pr. 2, 307 (1887), pr. 3, 307 (1889), and pr. 4, 307. 1892; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; L. H. Bailey in A. Gray, Field Forest & Gard. Bot. 341. 1895; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; Selby, Bull. Ohio Agric. Sta. 83: 329. 1897; Britton & Br., Illustr. Fl., ed. 1, 3: 71, fig. 3060. 1898; A. S. Hitchc., Fl. Kans. pl. 14. 1899; Selby, Bull. Ohio Agric. Sta. 175: 350. 1906; MacDougal, Bot. Gaz. 43: 57. 1907; Robinson & Fern. in A. Gray, New Man. Bot., ed. 7, 689 & 924, fig. 879. 1908; M. A. Day, Check List 128. 1908; L. H. Bailey, Botany 372. 1911; Britton & Br., Illustr. Fl., ed. 2, 3: 96, fig. 3555. 1913; E. Brainerd, Vt. Agric. Exp. Sta. Bull. 187: 238. 1915; N. Taylor, Mem. N. Y. Bot. Gard. 5 [Pl. Vic. N. Y.] 525 & 526. 1915; E. J. Palmer, Ann. Mo. Bot. Gard. 3: 392. 1916; Blanchan, New Nature Lib. 6 [Wild Fls.] 41. 1916; R. M. Harper, Torreya 20: 72. 1920; Kanda, Bot. Gaz. 69: 54—71, fig. 11--17, 27--41, 43, 44, 60, 69, & 70, & pl. 6, fig. 1. 1920; J. H. Schaffner, Ohio Journ. Sci. 21: 133. 1921; K. V. O. Dahlgren, Bot. Notiser Lund 1923: 10. 1923; A. B. Seymour, Host Ind. Fungi N. Am. 587. 1929; G. T. Stevens, Illustr. Flow. Pl. Middle Atl. & N. Eng. States pl. 129. 1930; Merriman, Fl. Richmond & Vic. 219, pl. 35, fig. 9. 1930; Gier, Trans. Kans. Acad. Sci. 34: 261. 1931; Schwencke, Zytol. Untersuch. Verbenac. 3, 4, & 17--20. 1931; Stapf, Ind. Lond. 6: 428. 1931; Benner, Fl. Bucks Co. 255. 1932; Perry, Ann. Mo. Bot. Gard. 20: 246--248, 260, 282--285, & 356. 1933; E. J. Alexander, Journ. N. Y. Bot. Gard. 35: 133. 1934; Junell, Symb. Bot. Upsal. 4: 164 & 171. 1934; E. J. Palmer, Ann. Mo. Bot. Gard. 22: 629. 1935; Patermann, Beitr. Zytol. Verbenac. 6, 7, 10, 47, & 49. 1935; Dermen, Cytologia 7: 161—163, fig. 14. 1936; Moldenke, Revist. Sudam. Bot. 4: 18 & 19. 1937; E. L. Little, Am. Midl. Nat. 38: 385. 1938; Moldenke, Annot. & Classif. List 108. 1939; Moldenke, Alph. List Common Names 7. 1939; Moldenke, Prelim. Alph. List Invalid Names 44. 1940; C. C. Deam, Fl. Indiana 795, 797, & 1232, map 1722. 1940; Gates, Fl. Kans. 190. 1940; Moldenke, Suppl. List Common Names 15. 1940; Worsdell, Ind. Lond. Suppl. 2: 486—487. 1941; Moldenke, Suppl. List Invalid Names 7 & 10. 1941; Gates, Weeds Kans. 42 & 220. 1941; C. N. Jones, Ohio Journ. Sci. 41: 340. 1941; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 18 & 19. 1942; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 51: 127. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 1—11, 74, 76, & 102. 1942; Moldenke, Alph. List Invalid Names 45 & 50. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 1—3. 1943; E. L. Braun, Annot. Cat. Sperm. Ky. 116. 1943; Allard & Leonard, Castanea 8: 47. 1943; Schnack & Covas, Darwiniana 6: 470. 1944; Moldenke, Phytologia 2: 87 & 117. 1945; H. E. Stone, Fl. Chester Co. 1124 & 1126. 1945; Moldenke, Am. Journ. Bot. 32: 609. 1945; Moldenke, Bot. Gaz. 106: 158—160. 1945; Moldenke, Castanea 10: 36—38. 1945; G. N. Jones, Fl. Ill. [Am. Midl. Nat. Monog. 2:] 216. 1945; Darlington & Janaki Ammal, Chromosome Atl. 270.

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1958; Moldenke, Résumé 4--19, 21, 22, 25, 26, 224, 357, 363, 365, 368, 373, 374, 416, & 474. 1959; Moldenke, Résumé Suppl. 1: 1 & 2 (1959) and 2: 1 & 11. 1960; Moldenke, Phytologia 8: 120, 121, & 124 (1961) and 8: 212, 244--246, 280, 317, & 435. 1962; Moldenke, Résumé Suppl. 3: 1, 2, & 4--6 (1962), 4: 1--3, 14, & 16 (1962), and 5: 1--4. 1962; J. D. Poindexter, Trans. Kans. Acad. Sci. 65: 418. 1962; Moldenke, Résumé Suppl. 6: 1 & 2 (1963) and 7: 1 & 2. 1963; Gleason & Cronquist, Man. Vasc. Pl. 579 & 580. 1963; G. N. Jones, Fl. Ill., ed. 3 [Am. Midl. Monog. 7:] 213. 1963; Steyerm., Fl. Mo. 1257--1260, map 1843, pl. 202, fog. 2. 1963; Moldenke, Phytologia 9: 50, 51, 148, 151, 165, 206, 214, 215, 219--221, 293, & 296 (1963), 9: 372 & 373 (1964), 10: 151--155, 174, 285, & 304 (1964), and 11: 21, 84, 86, & 109. 1964; Moldenke, Résumé Suppl. 10: 1 (1964) and 11: 1--3 & 8. 1964; A. L. Moldenke, Phytologia 10: 166. 1964.

Illustrations: Britton & Br., Illustr. Fl., ed. 1, 3: 71, fig. 3060 (1898) and ed. 2, 3: 96, fig. 3555. 1913; Kanda, Bot. Gaz. 69: 58, fig. 11--17, 59, fig. 27, 66, fig. 60, 67, fig. 69 & 70, 70, fig. 28--41, 43, & 44, & pl. 6, fig. 1. 1920; G. T. Stevens, Illustr. Flow. Pl. Middl. Atl. & New Eng. States pl. 129. 1930; Merriman, Fl. Richmond & Vic. pl. 36, fig. 9. 1930; Dermen, Cytologia 7: 161--163, fig. 14. 1936; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 132 (1952) and print. 2, 3: 132. 1958; Strausbaugh & Core, Fl. W. Va. 3: 777. 1958; Steyerm., Fl. Mo. pl. 202, fig. 2. 1963.

Perennial herb; roots fibrous; stems chiefly erect, 1--6.5 dm. tall, very slender, tetragonal, simple or sparingly fastigiate-branched above, occasionally branched from the base, sparsely strigose-hispidulous; branches ascending, usually sparsely strigillose; leaves decussate-opposite or sometimes apparently whorled, sessile or subsessile, linear or linear-lanceolate to narrow-lanceolate, lanceolate, narrowly oblong, or spatulate, sometimes oblanceolate, 2.5--10 cm. long, 6--8 mm. wide, bright-green, obtuse or subacute at the apex, long-attenuate or tapering into the subsessile base, varying from entire to minutely sharp-serrate, subserrate, or serrulate, to distantly or coarsely and irregularly serrate, lineate- or reticulately rogose above and occasionally scabrous, somewhat prominently veined beneath, glabrate or sparsely strigillose on both surfaces, especially along the raised vein reticulation beneath; spikes slender or filiform, usually solitary at the apex of the stems and branches or subternate, strict, elongate, usually rather densely many-flowered, strigose-scabrid; bractlets lanceolate-subulate, commonly shorter than the calyx or subequaling its tube, glabrous or nearly so; calyx 3--4 mm. long, the teeth acute; corolla hypocrateriform, varying from deep-lavender, pale blue-lavender, or lilac to purple, pale purplish-blue, pale-blue, light-blue, blue, or light-violet, smoothish, its tube scarcely longer than the calyx, with scattered hairs at the mouth, the limb 5--6 mm. wide; fruiting-calyx angulate, 4--5 mm. long, sparsely pubescent, the lobes acuminate, recurved, surpassing the fruit; fruits crowded, the cocci linear, 2.5—3 mm. long, raised-reticulate above, striate toward the base; chromosome number: x = 7, 2x = 14.

It is worth noting here that according to Kanda the haploid number of chromosomes is 4. Patermann (1935), however, says "Anderseits ist es aber auch nicht ganz von der Hand zu weisen, dass die untersuchte Pflanze ein Bastard war, weil, wie auch schon Kanda angibt, häufig Zwischen-formen zwischen den einzelnen Verbena-Arten vorkommen, was um so mehr verständlich ist, als alle Arten der Gattung Verbena die Haploidzahl 6 besitzen."

Walpers (1845) classifies this species in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Micranthae, and Secondary Subgroup Holophyllae with 22 other species.

The type of V. rugosa Muhl. appears to be Muhlenberg s.n. [Herb. Willdenow 1119] in the Willdenow Herbarium at Berlin. The name, V. angustifolia L., is based on Herb. Vigener s.n., from material cultivated in the Botanical Garden at Heidelberg, Germany, while V. cuneifolia Wallberg is based on Wallberg s.n. from material cultivated in "Hort. Proprio", Sweden, in 1802, from seeds secured from Pennsylvania. It should be noted here that the V. angustifolia of Lamarck is V. gracilescens (Cham.) Herter, while that of Miller is Stachytarpheta angustifolia (Mill.) Vahl; the V. cuneifolia of Hort. is V. hispida Ruíz & Pav., that of Rafinesque is V. stricta Vent., while that of Ruíz & Pavon is a valid species, which see; the V. integrifolia of Sessé & Mocino is also a valid species; and the V. rugosa of D. Don and of Sweet are V. rigida Spreng., while that of Michaux is V. stricta Vent.

Willdenow's description (1809) of Verbena rugosa Muhl. is worth repeating here: "*VERBENA rugosa. V. spicis filiformibus solitariis terminalibus alaribusve, foliis lanceolatis, basi attenuatis integerrimis, lineato-venosis. Verbena rugosa. Mühlenberg. V. (angustifolia) humilis erecta, foliis lineari-lanceolatis rariter subserratis, spicis filiformibus. Mich. amer. 2. p. 14. Habitat in Pensylvania, Tennassée. ♃. F."

Verbena simplex has been found by collectors in dry or open dry soil, sandy or open sandy soil, clay or dry loam soil, rocky or hard rocky soil, sand, dry or DeKalb loam, open sterile or dry rocky ground, thin limestone or gravelly soil, waste ground, and rather poor soil along roadsides. It inhabits dry or sandy fields, fallow or pasture fields, open ground, old pastures, open fields and meadows, roadside waste places, sandy loam or wet clay meadows, open roadside ditches, cedar and limestone glades, old fields, prairie fields, woods and dry sandy woods, cleared or oak woods, shallow soil on limestone outcrops, limestone quarries and rocky limestone slopes, the talus of limestone ledges, open and roadside waste places, moist meadows, weedy roadsides, ditches, cinder beds of railroads, dry rocky places around stonepiles in hayfields, and bare rocky regions in general. It has been collected on sandy and low sandy prairies, moist or sterile prairies, bluffs and river bluffs, steep dry or sandy banks, exposed cliffs, sand mounds, ballast, river flats and rocky bottoms, railroad tracks and embankments, low sandy or limestone hills, dry or sand hills, rocky or slate hillsides, rocky and rocky limestone slopes, creek banks, limestone slopes along creeks, limestone barrens, and gravel bars along streams, around old limestone quarries, in open woods, at the edges of woods and the foot of lime stone rocks, and along railroads, dry, clay, or open roadsides, rivers, and waysides, at altitudes of 400 to 2000 feet, flowering and fruiting from May to October.

Pammel & Fiske describe it as "common in sandy soil of creek bottoms associated with V. stricta, Potentilla canadensis, and Scutellaria parvula" and "common in sandy soil associated with Lithospermum canescens, Padus nana, and Fraxinus lanceolata". In Pennsylvania it is said by Stone (1945) to be "rare in moist sandy roadsides", flowering in early June, while Benner (1932) describes it as "rare and local" in "dry fields and waste places". Eames calls it "local in dry sandy fields" in Connecticut. Camp found it "scattered on limestone outcrops covered with Opuntia" in Virginia. Schallert refers to it as a "weed in dry fields" in North Carolina, while Cronquist calls it a "roadside weed" in Georgia. In Kentucky Wharton found it in black shale by a creek, McFarland says of it "usually in dry situations or in low places in fallow fields", while Braun (1943) reports it from "dry limestone soil of open slopes and roadsides". C. K. Dodge avers that it is "plentiful" in Saint Clair County, Michigan. In Tennessee McGregor calls it "abundant in shallow soil over limestone". In Arkansas it was found on basic soil on limestone by Robinson, while Dunn found it in "cutover oak woodland with regrowth 15--20 feet tall, fairly dense, clay soils".

In Illinois it inhabits "sandy humus underlaid by limestone", according to Chase, while G. N. Jones (1945) says "roadsides and fields. June--Aug......said to hybridize with V. stricta, V. hastata, and V. bracteata", but F. E. McDonald calls it "rare" in Peoria County. Gates (1940) says that it grows in dry soil mostly in the southern 2/3 of the eastern third of Kansas and calls it a hemicryptophite. Other collectors in that state found it in fencerows, along the edge of bluegrass pastures, roadsides, open sandstone areas, rocky ravines in the prairie, sandstone outcrops, heavily grazed prairie pastures bordering a scrub oak woods with sandstone surfacing, in rocky soil on south-facing slopes near bottom of draw, sandy soil of gully in upland woods, shrubby prairie pastures, open places in prairies or sandy prairies and on rocky hillsides, in clay soil along roadsides, in clay-loam in flat areas where the soil has been removed for road fill, in rocky soil in bluestem prairies, rocky limestone swales, open places in swales in bluestem prairies, ravines in tall bluestem prairies, open places among grasses on rocky prairie hillslopes and in ravines, in loam of moist thickets, on rocky prairies slopes in the dry bluestem association, wastelands, sandy soil of pastures and rocky prairie pastures, and in open places in ravines in rocky bluestem prairies. Hulbert calls it "scarce" and "very scarce", but McGregor describes it as "common" or "scattered"; Horr found it "scattered.

In Iowa, according to Thorne, it inhabits "sandy, alluvial flats and dry rocky ground, infrequent". Bush reports it as "common in barrens" in Missouri and McGregor found it "scattered to common on rocky hillsides" there, while Palmer (1935) says "Prairies, fields, and glades. Calciphile to circumneutral. Eastern, central, and southern Mo., south and east of a line drawn from Marion and Boone counties to Jackson Co." The Jesup 1955 collection cited below bears a notation to the effect that Prof. Tuckerman first discovered the species at that locality. In the Glass Flowers exhibit at Harvard University, model 509 is of this species, showing an opened corolla, a stamen, the pistil, and longitudinal and transverse sections of the ovary.

Common names recorded for V. simplex are "blue vervain", "burvine", "narrow-leaf vervain", "narrow-leaved verbena", "narrow leaved vervain", "narrow-leaved vervain", "pigmy vervain", "rugose vervain", "sand verbena", "verbena", "vervain", and "verveine à feuilles étroites". The plant is attacked by the following fungi: Aecidium verbenicola Ell. & Kellerm., Dicaeoma verbenicola Arth., Erysiphe cichoracearum DC., Puccinia vilfae Arth. & Holw., and Septoria verbenae Rob.

Specimens of V. simplex have been misidentified and distributed in herbaria under the names V. angustifolia x hastata Hill, V. caroliniana L., V. halei Small, V. hastata L., V. officinalis L., V. stricta Vent., Stachytarpheta angustifolia (Mill.) Vahl, and even Gerardia laevigata Raf. in the Scrophulariaceae. On the other hand, the C. R. Bell 4366, E. J. Palmer 10037, and S. M. Tracy 7533 & 8709, distributed as V. angustifolia or V. simplex, are actually V. halei Small; W. H. Chase s.n. [Madison, 7/27/1877] and W. H. Horr 6723 are V. hastata L.; Clevenger s.n. [Fletcher, Aug. 13, 1897] is in part V. hastata and in part V. urticifolia L.; Daniels s.n. [July 1903], Eggert s.n. [Pacific, 4 July 1896], W. H. Horr s.n. [Aug. 12, 1929] & s.n. [July 12, 1930], G. Merrill 571, and Rickett s.n. [Yancy Mills, Aug. 13, 1927] are xV. moechina Moldenke; A. Hayden 2 and H. A. Gleason 8845 (in part) are V. simplex var. eggerti Moldenke; R. L. McGregor 13217 is the type collection of V. simplex f. albiflora Moldenke; B. E. Smith 57 is Stylodon carneus (Medic.) Moldenke; Roy Morrison s.n. is Buchnera americana L. in the Scrophulariaceae; Paull s.n. [Oswego, 5/29/1886] is Lobelia puberula Michx. in the Lobeliaceae; and Jacobs 26 is Salvia azurea subsp. pitcheri (Torr.) Epling in the Lamiaceae. The Z. D. E. Brown s.n. [June 5, 1899], A. S. Hitchcock s.n. [Neosho Co., July 1896], and A. A. Jacobs s.n. [Monmouth, June 12, 1932], cited below, were all cited by Gates in his Kansas Flora as

"V. simplex x hastata", but I do not believe that they represent this hybrid. M. P. Somes 3301 is a mixture with xV. moechina.

The S. D. McKelvey 2523, cited below, is labeled "between Springfield and St. Louis"; M. W. Twaddell s.n. [July 22, 1869] may be from Augusta or Rockbridge County, Virginia, since its label is inscribed "between Staunton and Lexington". The specimen of Usteri 531 is inscribed "Brasilia", but was actually collected at Tottenville, Staten Island, New York!

The W. H. Rhoades s.n. [Sevierville Pike near Knoxville], cited below, has all its leaves broader than usual in this species. Deam says of his no. 20357a "very variable as to width and pubescence of leaves." Bohn 436, Eggert s.n. [12 Aug. 1875], H. A. Gleason 8845 (in part), Guttenberg s.n. [Sept. 10, '79], A. Hayden 2, Koenig s.n. [July 1878], Ruth s.n. [Knoxville, June 1900], Shacklette 609, and Sinclair, Dunn, & Spellman 913, all cited below, are rather too large, many-branched, many-spiked plants and probably should be regarded as var. eggerti Moldenke.

The M. S. Bebb s.n. specimen from Illinois, cited below, is marked "sp. ven." Schauer (1847) cites Michaux s.n. from somewhere in North America, Peter s.n. from Kentucky, Beyrich s.n. from Tennessee, and Durand s.n. from "Carolina", in the Berlin and DeCandolle herbaria. Harper (1920) records it with a question from Louisiana; Benner (1932) cites five collections from Bucks County, Pennsylvania; C. N. Jones (1941) cites Bartley & Pontius s.n. from Jackson County, Ohio; E. L. Braun (1943) records the species from Barren, Bell, Grayson, Hardin, Logan, Meade, Spencer, Todd, and Wayne Counties, Kentucky; Tatnall (1947) records it from Sussex County, Delaware, and from Dorchester County, Maryland; Deam, Yuncker, & Friesner (1946, 1948, 1951) record it from Hancock, Jay, and Washington Counties, Indiana. In Ohio Journ. Sci. 21: 133 (1921) it is recorded from Franklin County, Ohio, on the basis of a collection by J. H. Schaffner.

Steyermark (1963) records the species from Atchison, Bates, Benton, Butler, Caldwell, Callaway, Camden, Carroll, Cedar, Christian, Cole, Cooper, Crawford, Dade, Dallas, Daviess, Douglas, Gasconade, Hickory, Howell, Laclede, Livingston, Madison, Maries, Moniteau, Monroe, Morgan, Newton, Nodaway, Oregon, Osage, Perry, Pettis, Ralls, Ray, Ripley, Saint Charles, Saint Francois, Saline, Shannon, Texas, Vernon, Warren, Wayne, & Webster Counties, Missouri, on the basis of specimens in the herbarium of the Missouri Botanical Garden at St. Louis.

The species was apparently first introduced into cultivation in 1802 in Sweden, 1814 in Spain, 1822 in Belgium, and 1832 in France. MacDougal (1907) suggests that V. simplex may hybridize in the wild with V. bracteata. However, he cites no examples, gives no description, and does not actually say that he ever saw any such hybrid plants. I doubt very much whether the hybrid occurs, although G. N. Jones (1963) also claims that such a hybrid occurs in

Illinois. Van Vleet's surname is misspelled "Van Fleet" on some labels in the herbarium of the University of Oklahoma.

Perry (1933) cites the following 129 additional specimens and 1 photograph not as yet seen by me: ONTARIO: County undetermined: J. Macoun 1305 [Belleville] (G). VERMONT: County undetermined: W. H. Blanchard 26 (G), 60 (G). MASSACHUSETTS: Berkshire Co.: Hoffman s.n. [Sheffield, 27 Aug. 1902] (G). CONNECTICUT: New Haven Co.: D. C. Eaton s.n. [New Haven] (G); Harger s.n. [Fair Haven, 18 June 1886] (G). NEW YORK: Dutchess Co.: Hoysradt s.n. [Pine Plains, 1875] (G). County undetermined: Burnham s.n. [Tripoli, 25 July 1920] (G). NEW JERSEY: Bergen Co.: K. K. Mackenzie 4213 (E). Camden Co.: Brinton s.n. [Sicklerville, 21 June 1894] (G); Parker s.n. [22 June 1871] (G); Redfield 6430 (E). Union Co.: Trelease s.n. [Scotch Plains, 13 Aug. 1877] (E). PENNSYLVANIA: Chester Co.: Bartram 1021 (G). Franklin Co.: Green s.n. [Mercersburg] (G). Philadelphia Co.: Nuttall s.n. [Philadelphia] (G). York Co.: MacElwee 760 (E). County undetermined: Muhlenberg s.n. (E—photo). MARYLAND: Dorchester Co.: C. P. Smith 3186 (G). Montgomery Co.: H. D. House 1363 (E). DISTRICT OF COLUMBIA: Blanchard s.n. [Joy City, 19 June 1891] (E); Sudwith s.n. [Washington, 26 May 1889] (G). VIRGINIA: Bedford Co.: Curtiss s.n. [June 1873] (E). Botetourt Co.: A. B. Seymour 48 (G), 49 (E). Lee Co.: J. K. Small s.n. [about Cumberland Gap, 27 July 1892] (E, F, G). Loudoun Co.: H. D. House 875 (W). Smyth Co.: J. K. Small s.n. [Chilhowie, 4 Aug. 1892] (F). WEST VIRGINIA: Greenbrier Co.: Grimes 3716 (G). Lewis Co.: Small & Heller 432 (G). Monroe Co.: Steele & Steele 314 (E, G). NORTH CAROLINA: Buncombe Co.: Biltmore Herb. 4759b (G). SOUTH CAROLINA: Abbeville Co.: Hexamer & Maier s.n. [Abbeville District, July 1855] (G). GEORGIA: Catoosa Co.: J. K. Small s.n. [near Ringgold, 6—12 Aug. 1895] (F). FLORIDA: County undetermined: Rugel 127 [1842—49] (E, F). MISSISSIPPI: Oktibbeha Co.: C. L. Pollard 1312 (E, F, G). OHIO: Butler Co.: Overholts s.n. [Oxford, 16 June 1910] (E). Erie Co.: Moseley s.n. [Castalia, 27 July 1894] (G), s.n. [Sandusky, 28 July 1894] (F). ILLINOIS: Cook Co.: Greenman 1981 (E); H. H. Smith 5670 (G). Gallatin Co.: E. J. Palmer 15262 (E). Pulaski Co.: G. R. Vasey s.n. [Mound City, June 1859] (G). Randolph Co.: L. H. Pammel s.n. [Red Bud, 3 June 1888] (E). Rock Island Co.: Engelmann s.n. [Rock Island, 17 Aug. 1866] (E). Saint Clair Co.: Eggert s.n. [bluffs near Prairie du Pont, 20 June 1876] (E); Norton s.n. [East St. Louis, 9 July 1898] (E). Stony Island: Greenman 3640 (E); H. H. Smith 5923 (E, G). INDIANA: Harrison Co.: C. C. Deam 20357 (G, W). Saint Joseph Co.: Nieuwland 2685 (E). Tipton Co.: S. M. Deam s.n. [C. C. Deam 13619] (E). IOWA: Black Hawk Co.:

L. H. Pammel 272 (G). Johnson Co.: A. S. Hitchcock s.n. [Iowa City] (E). Louisa Co.: L. H. Pammel 1699 (E). County undetermined: Arthur 24 [17 July 1875] (E). KENTUCKY: Henry Co.: Eggleston s.n. [Smithfield, 30 May 1909] (N). Jessamine Co.: F. T. McFarland 109 (E). Lyon Co.: Eggleston 5237 (E). Simpson Co.: Anderson & Woodson 47 (E). Warren Co.: Price s.n. [Bowling Green, 21 May 1899] (E). TENNESSEE: Blount Co.: Curtiss 1955 (E, F, G). Carroll Co.: Biltmore Herb. 4759 (E, G). Cheatham Co.: Eggert s.n. [Kingston Spring, 5 Aug. 1897] (E). Davidson Co.: Eggleston 4430 (E). Hamilton Co.: Engelmann s.n. [Chattanooga, 25 Aug. 1876] (E). Knox Co.: Ruth 765 (E), s.n. [Knoxville] (F). WISCONSIN: Sauk Co.: Hale s.n. [Baraboo, 1861] (E, G). KANSAS: Anderson Co.: A. S. Hitchcock 791 (E, G). Linn Co.: Kellerman s.n. [Mound City, July 18, 1887] (E); Rydberg & Imler 120 (E). MISSOURI: Barry Co.: B. F. Bush 206 (E). Franklin Co.: Greenman 4125 (E); Kellogg 1130 (E); L. H. Pammel s.n. [Washington, 25 June 1888] (E); Trelease 713 (E). Greene Co.: Dewart 42 (E). Jackson Co.: B. F. Bush 7647 (E, G); Tindall s.n. [Independence, 1 June 1895] (E). Jasper Co.: E. J. Palmer 200 (E), 2981 (E), 3319 (E). Jefferson Co.: Eggert s.n. [20 June 1876] (E); A. S. Hitchcock s.n. [Victoria, 8 July 1890] (E); Riehl 456 (E); Steyermark 292 (E); Trelease s.n. [Crystal City, 14 May 1887] (E); Wislizenus 280 (E). Lincoln Co.: J. Davis 4552 (E). Macon Co.: B. F. Bush 7586a (E). Marion Co.: J. Davis 3588 (E). McDonald Co.: E. J. Palmer 4232 (E). Ozark Co.: E. J. Palmer 34766 (E). Phelps Co.: Kellogg 496 (E). Sainte Genevieve Co.: Greenman 4578 (E). Saint Louis Co.: Engelmann 336 (E), s.n. [banks of Mississippi above St. Louis, Oct. 1841] (E); King s.n. [mineral region southwest of St. Louis, June 1845] (E); Letterman s.n. [Allenton, 6 July 1911] (E). Stone Co.: E. J. Palmer 5769 (E). Taney Co.: B. F. Bush 450 (E). Wright Co.: Lansing 2976 (F, G), 3135 (F, G). Saint Louis: Engelmann s.n. [St. Louis, Sept. 1841] (G). ARKANSAS: Carroll Co.: Glatfelter s.n. [Beaver Station, Eureka Springs] (E). OKLAHOMA: McCurtain Co.: H. W. Houghton 3622 (E, G), 3646 (E, G). Osage Co.: G. W. Stevens 1980 (G). Ottawa Co.: G. W. Stevens 2299 (G). Rogers Co.: B. F. Bush 433 (E). Washington Co.: G. W. Stevens 2080 (G). The "Steele 314" which she cites is actually Steele & Steele 314; her "Hoyeradt" is a misspelling of Hoysradt; the Curtiss 1955, Pollard 1312, and Small s.n. [Chilhowie, 4 Aug. 1892], which she cites from "NY", are actually in the Columbia University Herbarium, while Short s.n. is in the Meisner Herbarium. She says "This species appears to be very closely related to V. hastata. In its typical form, it is readily distinguished by its elongate spikes and narrow leaves. Often, however, intermediate forms occur between the two, making it somewhat difficult to find clear lines of demarcation between them."

In all, 973 herbarium specimens, including the types of at least some of the names involved, and one mounted clipping have been examined by me.

Citations: QUEBEC: Jacques Cartier Co.: Holmes s.n. [Montreal] (T); Racine s.n. [Montreal, 17 juin 1934] (Um--255); Rouleau 1436 (Um--253). County undetermined: Dumas s.n. [Carré Chaptal] (Vi). Sainte Helene Island: E. Roy 2789 (N, Um--252, Vi, Vi), 3681 (Vi, W--1948911). Saint Paul Island: Rouleau 1125 (Vi). ONTARIO: Carleton Co.: Soper, Gillett, Calder, & Vick 3262 (Ca--882812, S). Hastings Co.: J. Macoun s.n. [July 10, 1871] (Mm--950). Victoria Co.: Bassett & Bragg 1474 (Vi). County undetermined: J. Macoun 54634 (N), s.n. [near Belleville] (Bm). NEW HAMPSHIRE: Grafton Co.: Jesup s.n. [25 June 1887] (Dt), s.n. [June 1894] (Dt). VERMONT: Bennington Co.: W. H. Blanchard 1 (Vt), 161 (N), s.n. [Arlington, July 1903] (Vt). Windsor Co.: Kittredge s.n. [Woodstock, July 24, 1918] (Vt). MASSACHUSETTS: Berkshire Co.: E. H. Eames 10365 (Dm). Hampshire Co.: Jesup 1955 (Dt). Middlesex Co.: Fernald s.n. [June 1894] (Dt). CONNECTICUT: Hartford Co.: T. Andrews s.n. [July 8, 1895] (We). Litchfield Co.: Eames & Godfrey 324 (Vi), s.n. [Kent, June 24, 1905] (Fl--21059). New Hanover Co.: M. Brandegee s.n. [New Haven] (Ca--468126); W. W. Denslow s.n. [New Haven, Aug. 1, 1866] (Ms); E. H. Eames s.n. [VIII.14.1893] (Vt); D. C. Eaton s.n. [New Haven, 1858] (S), s.n. [New Haven, 1859] (C); Harger 5832 (Vi); Kleeberger s.n. [New Haven, 6-22-1874] (Gg--31267); Safford 216 (W--515216); W. A. Setchell s.n. [Westville, Feb. 1885] (Ca--25177); W. W. Smith 10 (We); J. W. Wood s.n. [New Haven, June 1864] (Ms). County undetermined: Wright s.n. [Connecticut] (Go). NEW YORK: Bronx Co.: E. P. Bicknell 7337 (N), 7338 (N); Leggett s.n. [July 23d 1871] (Tc). Cattaraugus Co.: Fenno s.n. [July 30, 1903] (Al). Columbia Co.: McVaugh 2239 (Al, Up). Delaware Co.: P. Wilson s.n. [Arkville, July 9, 1915] (N). Dutchess Co.: Disbrow s.n. [Pine Plains, Aug. '03] (Nm, Nm); Hoysradt 86 (Ah), s.n. [Pine Plains, Oct. 1875] (Tc). Monroe Co.: Boughton 5762 (Al). Nassau Co.: E. P. Bicknell s.n. [Aug. 15, '03] (N). New York Co.: W. W. Denslow s.n. [July 1, 1867] (Ms). Queens Co.: Hexamer & Maier s.n. [July 31, '53] (Cm); S. O. Rusby s.n. [Woodhaven, July 1878] (Mi). Rockland Co.: H. N. Moldenke 7545 (N); Whitney 5374 (Al). Saratoga Co.: Cotton s.n. [June 28, 1905] (Al); H. D. House 10144 [June 30] (Al), 10144 [Sept. 18] (Al). Ulster Co.: H. D. House 25779 (Al). Washington Co.: S. H. Burnham s.n. [June 28, 1914] (Al). Westchester Co.: P. Wilson s.n. [Sept. 4, 1915] (N). Staten Island [Kings Co.]: Usteri 531 (B). County undetermined: W. W.

Denslow s.n. [New York] (Go); J. Torrey 749 (Al), s.n. [New York] (Bm, C, Mi, Pa); Torrey & Gray s.n. [N. Y.] (C). NEW JERSEY: Bergen Co.: Brinton s.n. [Closter] (Up—17073); Churchill s.n. [Englewood, July 1883] (Ba); L. Johnson s.n. [Hackensack Swamp, Sept. 6, 1876] (Lh); K. K. Mackenzie 4213 (N); Niederer s.n. [Carlstadt, July 26, 1883] (N); J. W. Wood s.n. [Lodi, July 1850] (Ms). Camden Co.: C. C. Stewart s.n. [Edmondson 2428] (N). Gloucester Co.: E. B. Bartram s.n. [June 23, 1907] (Um—60); I. Burk s.n. [Red Bank] (Up—17076). Hunterdon Co.: K. K. Mackenzie 5928 (N). Mercer Co.: Slack s.n. [Trenton] (Up—51869). Middlesex Co.: Monachino s.n. [Cheesequake State Park, July 4, 1950] (N). Monmouth Co.: N. L. Britton s.n. [Seabright, June 1877] (Tc); O. R. Willis s.n. [Freehold] (Mi). Morris Co.: F. C. Baldwin 81-1-2 (Nm); K. K. Mackenzie 7850 (N); E. Wall s.n. [Boonton, 19/6/31] (Ew, Ew). Passaic Co.: Hills s.n. [Paterson, June 24, 1894] (Fc); G. V. Nash 1064 (N), 1080 (N), s.n. [Clifton, July 31, 1892] (Ka, Lh); W. de W. Miller 1487 (N). Warren Co.: Teal s.n. [August 19, 1885] (Cm); C. S. Williamson s.n. [Asbury, June 23/07] (Up—47003). County undetermined: Brinton s.n. [Toppenton] (Up—17073); Knieskern s.n. (Br); Schneck s.n. [In a field between New York and Philadelphia, June 8, 1902] (Ur); Seaman s.n. (Pr). PENNSYLVANIA: Bedford Co.: Berkheimer 2675 (Ca—805800); O. E. Jennings s.n. [6/26/41] (Cm, Cm). Berks Co.: Wilkens 5191 (Gg—267619, Up). Centre Co.: H. A. Wahl 1316 (Ca—882813, No—8618, Pl—129972, Ur), 1747 (Hi—168733). Dauphin Co.: J. K. Small 106 (Ob—50753), s.n. [August 13, 1888] (Vt). Delaware Co.: Smith & Smith s.n. [Rhodes Swamp, June 10, 1865] (Up—17075). Erie Co.: Guttenberg s.n. [Sept. 10, '79] (Cm). Franklin Co.: True 27 (Up). Fulton Co.: Bright s.n. [Sept. 2nd, 1918] (Cm), s.n. [6-1-19] (Cm). Lancaster Co.: Disbrow s.n. (Nm); L. J. Miller s.n. [N. Lanc. Co.] (Vt); T. C. Porter s.n. [Aug. 26, 1862] (Cm); J. K. Small s.n. [vicinity of Conewago, May 28, 1889] (W—298656). Lebanon Co.: Arndt s.n. [Adamsdale, Aug. 22, 1916] (Up). Mifflin Co.: G. B. Grant 1434 [3060] (Po—267632). Montgomery Co.: Mumbauer s.n. [July 1, 1907] (St—22309). Northampton Co.: Tyler s.n. [Easton, 1892] (Dt). Perry Co.: Adams & Adams 2116 (Cm, Up); Gress, Jennings, & Jennings s.n. [July 25, 1920] (Cm). Philadelphia Co.: Martindale s.n. [Philad., July 1876] (Du—24173, Je—3149); C. F. Parker s.n. [June 1876] (C), s.n. [July 6, '78] (Pr). Schuylkill Co.: P. R. Wagner 7049 (Up). Snyder Co.: Wade & Wade 1726 (Up). York Co.: MacElwee 760 (N, Um—43); W. Stone 2165 (Up). County undetermined: Galen s.n. (Ur). DELAWARE: New Castle Co.: Brinton s.n. [Holly Oak, Aug. 19, 1888] (Up--17072). MARYLAND: Frederick Co.: W. E. Randall 4 (W--1927873). Kent Co.: Brinton s.n. [6/16/87] (Up--17074). Montgomery Co.: F. J. Hermann 9533 (Mi); C. S. King 2220 (La); Leonard & Killip 688 (Ur); Pieters s.n. [Cabin John, May 31, 1896] (Mi), s.n. [Chevy Chase, July 1, 1897] (Mi). Prince Georges Co.: T. Holm s.n. [Junii 5, 1900] (I). Talbot Co.: E. C. Earle 1504 (Up), 1640 (Up), 2773 (Up); Jump s.n. [June 16, 1937] (Up). Baltimore: W. R. Jones s.n. [Baltimore, June 22, 1904] (Mn--6887). DISTRICT OF COLUMBIA: F. Blanchard s.n. [19 June 1891] (N, Or--14720); E. S. Burgess s.n. (Ob--50754); Camby s.n. [D. C., 1881] (Fc--717); T. Holm s.n. [Junii 17, 1893] (I, S); Pieters s.n. [32nd & Canal Streets, July 30, 1899] (Mi); Rugel 196 (Br); C. S. Sheldon s.n. [June 1, 1881] (Al, Ob--97280); E. S. Steele s.n. [Washington, 1874] (Po--70657), s.n. [June 27, 1896] (Ob--50761); L. F. Ward s.n. [Washington, 1888] (Ka), s.n. (N). VIRGINIA: Albemarle Co.: F. Blanchard s.n. [Ivy City, June 19, '91] (Dt). Augusta Co.: Murrill s.n. [Ataunton, 23 May 1895] (Cm); M. W. Twaddell s.n. [between Staunton and Lexington, July 22, 1869] (Up). Bedford Co.: Curtiss 6715 (Mi), s.n. [June 6, 1871] (Al, Mi), s.n. [June 19, 1871] (S), s.n. [June 20, 1872] (Pu), s.n. (Mi). Botetourt Co.: A. B. Seymour 49 (Gg--358661, Lb--16172). Campbell Co.: Britton, Britton, & Vail s.n. [July 1, 1892] (C); Murrill s.n. [Lynchburg, 31 May 1927] (Fl--25520). Fairfax Co.: S. F. Blake 8473 (I); J. J. Carter s.n. [Falls Church, June 1876] (Tl); T. Holm s.n. [Septbr. 3, 1898] (I); Kinsley s.n. [June 26, 1888] (Ob--50757); W. R. Taylor 2810 (Up--75577). Fauquier Co.: Allard 1682 (N). Henrico Co.: MacCallum s.n. [Richmond, Aug. 1924] (Gg--144494). Lee Co.: F. C. Gates 17336 (Ka--79426); J. K. Small s.n. [about Cumberland Gap, July 27, 1892] (Ob--50760, Up--17071, W). Loudoun Co.: J. H. Holmes s.n. [Aug. 1888] (Lb--27617, Ua--11396), s.n. (Ur--22984); H. D. House s.n. [Bluemont, May 28, 1905] (W--492807). Mecklenburg Co.: F. R. Fosberg 15466 (Up). Middlesex Co.: Leonard & Killip 534 (W--1104588). Montgomery Co.: C. H. Hitchcock s.n. [Blacksburg] (Dt). Page Co.: Britton & Britton s.n. [Luray, Aug. 31, '85] (C); W. H. Camp 1364 (N). Roanoke Co.: C. E. Wood 5850 (Hi--51180). Rockbridge Co.: Brown, Hogg, Vail, Timmerman, Britton, & Britton s.n. [Natural Bridge, June 6, 1890] (V); F. H. Sargent 6908 (Gg--393050). Rockingham Co.: L. H. Bailey s.n. [Harrisonburg, July 1, 1918] (Ba); Shafer s.n. [Harrisonburg, Oct. 1888] (Cm); E. S. Steele 66 (W--2344483, We). Shenandoah Co.: Allard 9369 (W--1835067); Artz 570 (W--1634764). Smyth Co.: Britton, Britton, & Vail s.n. [June 23, 1892] (C, Cm); J. K. Small s.n. [Chilhowie, Aug. 4, 1892] (C).

Figure 16. Distribution of Verbena simplex in the United States

Herbarium curators who have material of this species from additional counties are asked to send it to the author for verification and record, so that future editions of this map may be more complete

Mapping by counties done by Andrew R. Moldenke

Washington Co.: W. H. Camp 1633 (N). County undetermined: R. C. Alexander s.n. [Valley of Virginia, 1850] (Ca--379993); C. S. Sheldon s.n. [Chain-bridge, 1 June 1881] (Ob--50752). Roanoke: Brown, Hogg, Vail, Timmerman, Britton, & Britton s.n. [May 29] (Bm); Small & Heller 432 (C). Williamsburg: Grimes 3738 (N). WEST VIRGINIA: Berkeley Co.: E. L. Core 5883 (We); J. L. Sheldon 2664 (We, We). Grant Co.: E. L. Core s.n. [Petersburg, July 13, 1935] (We); Davis & Davis 768 (We); West Va. Univ. Bot. Exped. 271 (We). Hampshire Co.: Frye 415a (We), 1219 (We), s.n. [June 20, 1933] (N); Koenig s.n. [July 1878] (Cm). Jefferson Co.: Davis & Davis 2908 (We); C. F. Millspaugh 865 (C, We); H. N. Moldenke 21764 (Bm); Puissant s.n. [Harper's Ferry] (Br); Strausbaugh 271 (We, We). Kanawha Co.: E. T. Harper 5687 (Cm). Mineral Co.: Strausbaugh s.n. [June 16, 1933] (We). Monroe Co.: Steele & Steele 314 (N, W--490291). Morgan Co.: Burton s.n. [Shady Grove Park, July 6, 1937] (Gg--267620, Sd--20296); Maysilles s.n. [August 30, 1941] (We). Pendleton Co.: E. L. Core 3676 (Ob--50755), s.n. [H. N. Moldenke 6822] (N). County undetermined: H. M. Gamble s.n. (We). NORTH CAROLINA: Buncombe Co.: Beadle s.n. [Biltmore, VII.1911] (La); Biltmore Herb. 4759b (N, W--332101). Burke Co.: Rugel s.n. [Morganton, June 17th, 1872] (W--310736). Chatham Co.: Kessler 573 (Hi--137459). Durham Co.: Blomquist 4710 (H--20440), s.n. [4/30/38] (Fl--12344); Fox, Godfrey, & Anderson 3624 (No--23139). Forsyth Co.: P. O. Schallert 1539 (H--5453). Gaston Co.: Columba 325 (I); P. I. Schmitt s.n. [June 1881] (I). Granville Co.: Ahles & Leisner 17402 (Hi--92929); Buell 1383 (No--8593); W. B. Fox 4910 (N). Jackson Co.: C. W. Galloway 2206 (Hi--54060). Madison Co.: J. D. Smith s.n. [Warm Springs, July 27, 1880] (W--1323042). Orange Co.: Ashe s.n. [near Chapel Hill] (W--327848); W. C. Coker s.n. [May 19, 1910] (Hi--59456); Collector undesignated s.n. [May 20, '91] (Hi--59452); A. Holland s.n. [May 21, 1929] (Hi--59453); H. R. Totten s.n. [June 15, 1915] (Hi--59455); Warnock s.n. [8/7/23] (Hi--59454). Polk Co.: E. C. Townsend 91 (Pl--87178), s.n. [Columbus, June 28, 1897] (W--341766). Rockingham Co.: G. de Chalmot s.n. [spray] (W--367383). Rowan Co.: Coit 1254 (No--8599); W. M. Davis s.n. [May 1882] (Up--17073). SOUTH CAROLINA: York Co.: Ahles & Haesloop 27167 (Hi--104399). GEORGIA: Bartow Co.: W. H. Duncan 8427 (Gu--29950). Catoosa Co.: J. K. Small s.n. [near Ringgold, Aug. 6--12, 1895] (C, Io--20749). Cherokee Co.: W. H. Duncan 8349 (Gu--29977). Clayton Co.: B. B. Higgins s.n. [Lovejoy, 7-1-29] (Ga). Dade Co.: W. H. Duncan 2600 (N). Floyd Co.: H. C. Jones 155 (Gu--19913). Fulton Co.: J. H. Barnhart 2253 [Herb. Barnhart

2697] (N). Richmond Co.: Cuthbert s.n. [Augusta, Aug. 7, 1900] (Fl—21057). Meriwether Co.: Wetherill s.n. [Warm Springs, Aug. 1882] (Up). Walker Co.: Cronquist 5280 (Gu—30233, N, Tl, W—1928668), 5299 (Ca—777467); P. Wilson 161 (N, W—384816). Whitfield Co.: R. M. Harper 385 (N, W—384817). FLORIDA: County undetermined: F. W. Chapman s.n. (C); Rugel 127 [1842--49] (W--511956). ALABAMA: Blount Co.: C. F. Baker s.n. [Blount Springs, 5/5/98] (Po—63885), s.n. [Blountsville, 5/6/98] (Cm, Ur, Vt, W--344791). Choctaw Co.: Schuchert s.n. [Cocoa, October 13--15, 1896] (W--288831). Cullman Co.: C. T. Mohr s.n. [Cullman, May 29, 1892] (W--771847); M. Morgan 69 (I). DeKalb Co.: Moldenke & Woods 507 (S). Etowah Co.: Moldenke & Woods 508 (S). Jackson Co.: Earle s.n. [Scottsboro, 6/30/99] (N); A. R. Moldenke 773 (S). Mobile Co.: Dukes s.n. [Mobile, June 1905] (Rf). Montgomery Co.: Farr s.n. [Montgomery, May 14, 1911] (Up—52678). Wilcox Co.: Buckley s.n. [July 1840] (T, W—771847). County undetermined: M. Martens s.n. (Br); G. R. Vasey s.n. [Alabama, 1878] (W); Winchell 138 (W). MISSISSIPPI: Oktibbeha Co.: C. L. Pollard 1312 (C, Po—70659, W—271684). Panola Co.: Herb. Univ. Ill. s.n. [Long Creek] (Ur). OHIO: Adams Co.: E. L. Braun s.n. [June 23, '26] (Cn); D. M. Brown s.n. [July 27, 1940] (N). Butler Co.: J. Ferguson s.n. [July 9, 1932] (Ob—80588); L. Roth s.n. [6/9/34] (Or—43759, Or—43760, Or--45393); Wehmeyer & Waters 42 (Mi). Champaign Co.: E. C. Leonard 1610 [Herb. Leonard 4351] (W--2161286), 19069 (W—1848487). Erie Co.: O. E. Jennings s.n. [July 8, 1911] (Cm); Moseley s.n. [Sandusky, July 28, 1894] (W--431257); L. H. Pammel 67 (Io—54037); T. Schoepfle s.n. [Sand Hill, May 31, 1896] (Mi); York s.n. [Cedar Point, 10 July 1902] (Up). Hamilton Co.: Aiken 10673 (Ll), s.n. [Aug. 20, 1904] (Po—267634); E. L. Braun s.n. [8/15/05] (Cn, Cn), s.n. [6/18/09] (Cn), s.n. [Aug. 9, '17] (Cn). Highland Co.: Bartley & Pontius 287 (N). Lorain Co.: Rudolph s.n. [6-8-96] (Ob--75327). Ottawa Co.: J. C. Britton s.n. [Lakeside, May 26, 1896] (Fl--21060); M. E. Day s.n. [July 30, 1893] (Ob--99795); Redick s.n. [July 15, 1890] (Ob—80589); B. H. Thorne s.n. [June 23, 1897] (Ob--80590); York s.n. [Lake Side, 8-1-1902] (Dp, Up). ILLINOIS: Boone Co.: E. W. Fell 52652 (Il—38878); Fell & Fell F.46390 (Il—21217). Champaign Co.: Winterringer 569 (Ur). Christian Co.: R. G. Mills s.n. [June 25, 1898] (Ur). Cook Co.: Arthur s.n. [La Mont, July 11, 1883] (Ah); H. H. Babcock 9380 (Bz—23723), s.n. [June '70] (Br), s.n. [Chicago] (W--787354); R. Bebb 1683 (Ok), 1684 (Ok), 1685 (Ok); S. A. Cain s.n. [Prairie, August 1926] (Bt--2467, Bt--2468); M. A. Chase 1374 (Ur), 1620 (Ur, Ur, W—443181), s.n. [Aug. 5, 1899] (Ur); G. D. Fuller 1220 (Il—16014); Fuller & Link 348 (Il—16012); E. Hall s.n. (W); E. J. Hill

152.1902 (Ur); F. W. Johnson 1753 (Go, N); Lansing 242 (Ur), 1393 (Ur, Ur); Munroe s.n. [Riverside] (Mi); L. T. Nelson s.n. [Chicago, June 1898] (N); Warne s.n. [July 1870] (Al). DuPage Co.: Munroe s.n. [Hinsdale, Aug. 1876] (Po—70662); P. B. Whitford 357 (Il—33828). Hardin Co.: Winterringer s.n. [May 29, 1949] (Ur). Jackson Co.: Fuller & Welch 918 (Il—15874); McCree 918 (Ur); A. B. Seymour s.n. [Aug. 19, 1880] (Ur—80010). Jo Daviess Co.: Ahles 4399 (Ur); V. H. Chase 6741 (Ur); Pepoon s.n. [Rush Tp., Aug. '84] (Ur); Winterringer 8039 (Il—37493). Johnson Co.: Schneck s.n. [Vienna, May 16, 1899] (Ur); Winterringer 3174 (Il—28407). Kane Co.: Boyce s.n. [Aurora, 1878] (Vt). Kankakee Co.: C. C. Crampton 363 (W—750626); E. H. Hill 72.1871 (Ur). Kendall Co.: Arthur s.n. [Oswego, Aug. 24, 1874] (Ah). LaSalle Co.: V. H. Chase 4065 (Ur); G. D. Fuller 2300 (Il—16011); McDougall 44 (Ur); R. G. Mills s.n. [July 3, 1944] (Ur); Raymound s.n. (Ur—17457). Lee Co.: Keithley 460 (Il—23257). Macoupin Co.: W. E. Andrews s.n. [June 21, 1889] (Ur). Marshall Co.: V. H. Chase 10660 (Ur, Ur). McHenry Co.: Benke 5686 (N); G. Vasey s.n. [Ringwood] (C). McLean Co.: L. M. Underwood s.n. [Normal, July 17, 1880] (Cm). Ogle Co.: Ahles 4537 (Ur); W. S. Moffatt 480 (Ur). Peoria Co.: F. E. McDonald s.n. [Peoria, Aug. 1898] (Ur); W. S. Moffatt s.n. [Romeo, Aug. 24, 1895] (Ur). Pope Co.: Ahles 2782 (Aa). Pulaski Co.: Herb. Univ. Ill. 30011 (Ur); Pearsall 19 (Il—22257). Putnam Co.: V. H. Chase 10664 (Ur). Randolph Co.: Winterringer 6711 (Il—34281). Saint Clair Co.: Brendel s.n. [1850] (Ur); Eggert s.n. [across from St. Louis, 13.6.75; Herb. Geete 5697] (Go); J. Neill 319 (Il—23398); Welsch s.n. (Ur). Sangamon Co.: G. D. Fuller 2275 (Il—16008); A. B. Seymour s.n. [Springfield Junction, 8 July 1879] (H—106463). Will Co.: Boyce s.n. [Joliet, June 14, 1881] (Io—92229); Umbach 1702 (S), 5720 (Ca—441522, Ka), s.n. [Romeo, Aug. 25, 1897] (Ur), s.n. [Romeo, June 18, 1898] (Hp, W—339476). Winnebago Co.: M. S. Bebb s.n. [Fountaindale] (Dt, N); R. Bebb s.n. [Rockford, Spring 1879] (Ok); E. W. Fell 51308 (Il—38605); Fell & Fell F.48-340 (Ur); G. D. Fuller 13746 (Il—31276); Fuller & Haine 247f (Il—16013), 2204h (Il—16009); L. H. Pammel 291 (Se—70052); Pammel & Fisk 291 (Io—126997); W. H. Rhoades s.n. [Rockford] (Hs), s.n. [near Rockford] (Hs). County undetermined: M. S. Bebb s.n. [Illinois] (Bm); R. Burgess s.n. [June 1883] (Io—92228); Eggert s.n. [Bluffs in Illinois, 13 June '75] (Cm, Gg—31271, Po—125373), s.n. [Bluffs in Illinois, 20 June '76] (Cm, N, W—754562); Mead s.n. (C); G. R. Vasey 1 (Il—16004). Stony Island: H. H. Smith 5923 (Ca—882565). INDIANA: Carroll Co.: Friesner 8836 (Bt—28517). Cass Co.: C. C. Deam 17878 (Dm), 48838

(Dm), 59003 (N); Ek s.n. [6-12-1936] (Bt--42533); Friesner 8789 (Bt--28887), s.n. [Logansport, 9/12/30] (Bt--5209, Bt--5210). Crawford Co.: C. C. Deam 16484 (Pu), 20383 (Dm); Schneck s.n. [July 4, 1893] (Ur). Daviess Co.: H. J. Clements s.n. [7/16/95] (Pu); C. C. Deam 25585 (Dm). DeKalb Co.: C. C. Deam 3234 (Dm, We). Harrison Co.: C. C. Deam 20357a (Dm), 58323 (N); Friesner 5669 (Bt--14149, Ca--540431, Ew, Lb--13544), 14366 (Bt--50988, Gg--310873, Gu--21559, H--68383, Ky, N). Jackson Co.: C. C. Deam 13519 (Dm). Jasper Co.: Welch 125 (Dp). Jefferson Co.: C. R. Barnes s.n. [Hanover, 6-23-76] (Pu); C. C. Deam 16195 (Dm); A. H. Young s.n. [Hanover, 1875] (Pr), s.n. [Hanover, May 12, 1880] (Pu), s.n. [Hanover] (Gg--31269). Kosciusko Co.: Friesner 15429 (Bt--54972). Lake Co.: F. C. Gates 1127 (Mi); F. W. Johnson 389 (N, N); E. D. McDonald s.n. [Hammond, June 12, 1942] (W--1888413); Umbach 1841 (Ca--441523). Lawrence Co.: Kriebel s.n. [near Georgia, 6-4-33] (Bt--19474). Marion Co.: C. C. Deam 6953 (Dm). Marshall Co.: C. C. Deam 31862 (Dm). Monroe Co.: V. Davis s.n. [Bloomington] (In--2286); Gheen s.n. [Bloomington] (In--2325); Gullion s.n. [Ellettsville] (In--4225); Wynn 63 (Au, Gu--27366). Newton Co.: M. McKee 866 (Dp). Porter Co.: H. R. Bennett s.n. [August 18, 1957] (Go). Posey Co.: C. C. Deam 16808 (Dm); F. J. Hermann 6640 (Mi, N). Putnam Co.: Grimes 163 (Dp). Saint Joseph Co.: Nieuwland 2685 (N, W--643884). Tipton Co.: S. M. Deam s.n. [C. C. Deam 13619] (Dm, Pu). Vermillion Co.: C. C. Deam 11944 (Dm). Warren Co.: Friesner 22854 (Ok, S, St). White Co.: Pipal s.n. [Monon, 7/11/12] (Ah). IOWA: Benton Co.: J. J. Davis s.n. [Vinton, 1877] (S), s.n. [Vinton] (Du--24172). Black Hawk Co.: A. S. Hitchcock s.n. [Waterloo, 8/28/89] (Io--15304); L. H. Pammel s.n. [Cedar Falls, Aug. 13, '08] (Io--78236, Io--78238), s.n. [Cedar Falls, VII-18-1927] (Io--129417); Pammel, Fisk, & Gilbert 272, in part (Io--127005, N); Shimek s.n. [July 1, 1921] (Ur). Cedar Co.: Fay 409 (Vi), 1017 (Ca--965064). Cerro Gordo Co.: A. Hayden 1, in part (N), 3, in part (N, N, N, N). Clinton Co.: C. R. Ball s.n. [June 30, 1898] (Io--15308); L. H. Pammel 7 (Io--53991). Floyd Co.: Collector undesignated s.n. (Io--15306). Johnson Co.: A. S. Hitchcock s.n. [Iowa City, June 1887] (Io--15305), s.n. [Iowa City, June 1, 1889] (Ka), s.n. [Iowa City, 1889] (Io--15307), s.n. [Iowa City] (Io--15303); R. F. Thorne 17397 (W--2328928); Treat s.n. [July 1865] (Ms). Lyon Co.: L. H. Pammel s.n. [Granite, Aug. 28, 1920] (Io--98606). Marion Co.: Brendel s.n. (Ur). Muscatine Co.: W. A. Anderson s.n. [east of Nichols, Sept. 9, 1936] (Ca--882564); Este & Brown s.n. [south of Muscatine, summer 1935] (Io--146364); Shimek s.n. [June 28, 1913] (N), s.n. [Aug. 21, 1915] (Ur), s.n. [Moscow, June 28, 1917]

(N). O'Brien Co.: Winge s.n. [Calumet, Maj 1911] (Cp). Scott Co.: E. A. Ross s.n. [Davenport, Aug. 1889] (Se--95717). County undetermined: Somes 3301, in part [Blackstrap] (W--672170). KENTUCKY: Allen Co.: H. A. Gleason 8907 (N). Anderson Co.: Wilburger 1955 (Ka). Bell Co.: H. A. Gleason 8845, in part (N). Bullitt Co.: W. H. Rhoades s.n. [Salt River] (Hs). Caldwell Co.: Sinclair, Dunn, & Spellman 913 (Lb--51376). Christian Co.: Ahles 7540 (Ur). Edmonson Co.: Lix 217 (W--1970472); Edw. Palmer s.n. [vicinity of Mammoth Cave, May 1899] (N, W--360416). Fayette Co.: Kellerman s.n. [Lexington, June 14, 1882] (Ka); F. T. McFarland s.n. [Lexington, May 27, 1915] (Ky--1776); R. Peter s.n. [Lexington, July 1833] (Mi); Short s.n. [Lexington, 1837] (Mi), s.n. (Ll). Franklin Co.: F. W. Pennell 10719 (N). Hart Co.: W. H. Rhoades s.n. [near Macon, July 1927] (N). Jessamine Co.: F. T. McFarland 109 (Ky, S, Vi); J. W. McFarland 1092 (Ky); Wharton 8906 (Hi--188364). Knox Co.: W. H. Rhoades s.n. [Wilton, July 1927] (N). LaRue Co.: F. C. Gates 17153 (Ka--80976); W. H. Rhoades s.n. [Attilla, July 1927] (N). Livingston Co.: Eggleston 4458 (N). Lyon Co.: Eggleston 5237 (N). Madison Co.: A. A. Wright s.n. [June 10, '76] (Ob--50758). Marion Co.: Wharton 4674 (N). McCreary Co.: H. J. Rogers 630 (Ky). Mercer Co.: F. T. McFarland 2988 (Ky). Nelson Co.: Agnes s.n. [June 10, 1933] (I). Perry Co.: R. Peter s.n. [July 6, 1833] (Ky--1777). Rockcastle Co.: Potzger 3196 (Bt--13397); Smith & Hodgdon 3705 (N, W--1725668); Wharton 2595 (Hi--188699). Scott Co.: Singer 178 (W--1465701). Taylor Co.: E. S. Lyon 12 (Ky). Union Co.: Shacklette 609 (Ky). County undetermined: R. Peter s.n. [Kent River, July 1833] (C); Short s.n. [1840] (M). TENNESSEE: Blount Co.: Curtiss 1955 (C, Du--90900). Carroll Co.: Biltmore Herb. 4759 (N, W--332100); Demaree 30781 (Au--122691, Au--122693, Hi--51367, Le, Mi, Ok). Carter Co.: J. D. Smith s.n. [July 8, 1880] (W--1323041). Claiborn Co.: F. E. Lloyd s.n. [Aug. 13, 1888] (Cm). Davidson Co.: Ainslie s.n. [June 1, '14] (Ka--67075), s.n. [Nashville, June 3, 1915] (Mi); P. V. Beck 326 (Ok); W. Bohn 436 (Lb--23710); Eggleston 4430 (Cm, Dt, N, W--586150); Hodges s.n. [Nashville, May 26, 1934] (Fl--1203); W. Palmer s.n. [Nashville, Nov. 7, 1897] (W--316318); Quarterman 821 (H--108462, Va), 1183 (Au); Shanks 1534 (Ca--882563); R. H. Ward s.n. [Nashville, March 1862] (Ur). Decatur Co.: Nason s.n. [May 1855] (Ur). Grundy Co.: Calef 565 (Ur); W. H. Rhoades s.n. [Mt. Eagle] (Hs); Richards & Maguire s.n. [Mount Eagle, June 6, 1930] (Ua--8843). Hamilton Co.: J. H. Barnhart 2283 [Herb. Barnhart 2727] (N). Henry Co.: A. R. Moldenke 112 (Fg). Humphreys Co.: Galloway s.n. [June 8, 1889] (Ob--50759). Jefferson Co.: Biltmore Herb. 4759c (S); Rugel 127 (Bm). Knox Co.: Lamson-Scribner s.n. [vic. of Knoxville, June 1890] (W--264002); W. H. Rhoades s.n. [Sevierville Pike near Knoxville] (Hs); Ruth 731 (W--345916), 740 (N), s.n. [Knoxville, June 1895] (Gg, N, Ob--50750, Po--63886, S, Ur), s.n. [Knoxville, June 1900] (Dt). Lawrence Co.: G. Een s.n. [26.7.1950] (S). Mc Minn Co.: Moldenke & Woods 499 (S). Meigs Co.: A. R. Moldenke 777 (S). Montgomery Co.: A. R. Moldenke 109 (Fg). Roane Co.: Nease 517 (W--2175281). Rutherford Co.: Demaree 45755 (S); R. L. McGregor 16899 (Lw), 17160 (Lw). Stewart Co.: A. R. Moldenke 110 (Fg). Wayne Co.: McDougall 1059 (W--1925242). White Co.: Weatherby & Weatherby 6276 (N). Wilson Co.: C. C. Deam 61340 (N, Si); Demaree 45737 (S); W. H. Rhoades s.n. [near Lebanon, Aug. 1931; H. N. Moldenke 17076] (Bt, Bt--30665, N, St). County undetermined: G. B. Grant 2808 [3060] (Po--267633); Whelden s.n. [May '91] (Fl--21058). MICHIGAN: Lenawee Co.: D. Houghton s.n. [Sept. 14, 1838] (Mi). Saint Clair Co.: C. K. Dodge s.n. [Port Huron, July 12, 1897] (Mi), s.n. [July 8, 1903] (Mi, Ob--87444); A. Robinson s.n. [Port Huron] (Cm). WISCONSIN: Lafayette Co.: H. H. Smith 7783 (B, Ws). Milwaukee Co.: J. S. Douglas s.n. [Wis.] (Je--3147); Shinners 531 (Ws). Sauk Co.: T. J. Hale s.n. [Baraboo, 1861] (Ws). County undetermined: Skavlem s.n. [Harmony, July 3, 1890] (Ws). KANSAS: Allen Co.: A. S. Hitchcock s.n. [Allen Co., July 1896] (Ka). Anderson Co.: A. S. Hitchcock 791 (Ka, N, W--353582), s.n. [Anderson Co., July 1896] (Ka); W. H. Horr s.n. [July 22, 1929] (Lw); R. L. McGregor 4267 (Lw); B. L. Wagenknecht 3657 (Lw). Bourbon Co.: Kellerman s.n. [Ft. Scott, July 15, 1887] (Ka); Z. D. Thompson 541 (Lw). Butler Co.: R. L. McGregor 7257 (Lw). Chase Co.: Hulbert 3639 (Lw). Chautauqua Co.: A. S. Hitchcock s.n. [Chautauqua Co., Aug. 1896] (Ka); W. H. Horr s.n. [July 5, 1930] (Lw); R. L. McGregor 10826 (Lw). Cherokee Co.: A. A. Jacobs 70 (Ka--74127), s.n. [Monmouth, June 12, 1932] (Ka--77596); R. L. McGregor 1746 (Lw). Coffey Co.: W. H. Horr 3476 (Lw); Wimpey s.n. [Burlington, July 1896] (Ka). Cowley Co.: R. L. McGregor 10387 (Lw); M. White s.n. [June '98] (Ka). Crawford Co.: A. S. Hitchcock s.n. [Crawford Co., Aug. 1896] (Ka); W. W. Holland 298 (Lw); Hulbert 3750 (Lw). Douglas Co.: W. H. Horr E.76 (Au--121596, Ca--45188, Gg--396798, Lw, No--12739, Ok, S, St, Tl, Tl, Ur, Vi, W-2031047, We); R. L. McGregor 117 (Lw, S); Snow 6715 (Lw), s.n. [June] (Fl--21062); W. C. Stevens s.n. [Lawrence, June] (Ca--104832, W--216021). Elk Co.: Clothier & Whitford s.n. [Aug. 20 & 21, 1897] (Ka); R. L. McGregor 10337 (Lw). Franklin Co.: Hetzer 215 (Lw); R. L. McGregor 10057 (Lw). Greenwood Co.: A. S. Hitchcock s.n. [Eureka, July 1892] (Ka); W. H. Horr s.n. [July 28, 1930] (Lw); R. L. McGregor 10306a (Lw), 17220 (Lw). Johnson Co.: Pellet s.n. [June 1898] (Ka); Roofe s.n. [Spring Hill, May 1925] (Ka--

71597). Labette Co.: Clothier & Whitford s.n. [Aug. 18, 1897] (Ka); Etter s.n. [June 1, 1950] (N); Imler 322 (Ms); Imler & Rydberg 322 (Bl--42279, Lw). Leavenworth Co.: W. H. Horr s.n. [6/23/30] (Lw). Linn Co.: Kellerman s.n. [Mound City, July 17, 1887] (Ka), s.n. [Mound City, July 18, 1887] (C, Ka); H. N. Moldenke 21924 (Lw); Rydberg & Imler 120 (Lw). Lyon Co.: C. J. Elmore s.n. [Emporia, June 20, 1922] (Je--3146); H. A. Elmore s.n. [Emporia, June 20, 1922] (Je); W. H. Horr s.n. [6/26/30] (Lw). Miami Co.: Clothier & Whitford s.n. [Aug. 8, 1897] (Ka); R. L. McGregor 10476 (Lw); Oyster s.n. [Summer 1883; Herb. Prager 18630] (Gg--31266, Ob--50751); Rohrer 53 (St--20839); Rydberg & Imler 29 (Ka--74647, Lw, N); B. L. Wagenknecht 3719 (Lw). Montgomery Co.: W. H. Horr s.n. [July 5, 1930] (Lw); D. L. Marsh 408 (Lw); R. L. McGregor 4327 (Lw), 14379 (Lw). Neosho Co.: A. S. Hitchcock s.n. [Neosho Co., July 1896] (Ka); W. W. Holland 108 (Lw); R. L. McGregor 10275 (Lw). Osage Co.: Z. D. E. Brown s.n. [June 5, 1899] (Ka); B. L. Wagenknecht 4124 (Lw). Republic Co.: A. S. Hitchcock s.n. [Courtland, June 26, 1892] (Ka). Shawnee Co.: Maus s.n. [Auburn, July 23, 1927] (Ka--72217). Wabaunsee Co.: Carleton & Norton s.n. [Mill Creek, 7-14-1893] (Ka); Maus 74 (Ka--72513); R. L. McGregor 9160 (Lw). Wilson Co.: Darnell s.n. [June 1890] (Ka); W. H. Horr s.n. [July 13, 1930] (Lw); R. L. McGregor 10260 (Lw); Vaughn s.n. [Aug. 20, 1936] (Lw). Woodson Co.: Clothier & Whitford s.n. [Aug. 29, 1897] (Ka); W. H. Horr s.n. [7/11/30] (Lw); E. W. Lathrop 204 (Lw, W--2234984), 282 (W--2235008), 386 (Lw, W--2235049), 611 (Lw, W--2235112), 828b (W--2235153). County undetermined: Ripley s.n. [E. Kansas, June 19, 1899] (Je--3145). MISSOURI: Barry Co.: B. F. Bush 206 (Ka, S, W--318217), 15051 (Lb--15327). Barton Co.: Z. Williams s.n. [Milford, Aug. 1928] (Lb--4172). Boone Co.: Daniels s.n. [June 17, 1902] (Lb--9184), s.n. [Columbia, July 3, 1903] (Lb--4168, Lb--4169); Drouet 613 (Lb--12122), 3122 (Lb--25690); D. B. Dunn 12553 (Lb--38025). Carter Co.: R. L. McGregor 17182 (Lw). Cass Co.: Keetch s.n. [Lisle, July 1, 1934] (Je--3148). Clay Co.: Gier s.n. [VI-4-50] (Je--6799). Dent Co.: F. H. Sargent s.n. [May 29, 1932] (No--10919). Franklin Co.: J. M. Mason s.n. [Meramec State Park, 7/5/35] (Lb--34372); Muenscher & Winne 16728 (Au--122694, Ca--916312). Greene Co.: Blankinship s.n. [Willard, July 24, 1919] (Po--63845); McKelvey 2523 (W--1581464); P. C. Standley 8311 (W--687272), 9336 (W--688251). Grundy Co.: Crookshanks 85 (Lb--29655). Henry Co.: Drouet s.n. [May 22, 1932] (Lb--10344). Iron Co.: Churchill s.n. [Ironton, May 25, 1918] (Ba). Jackson Co.: B. F. Bush 285 (C), 343 (Ok), 477 (C), 914 (W--281373), 7647 (N, W--838033), 8647 (Ur), s.n. [7-3-1892] (Lb--4174); K. K. Mackenzie s.n. [Lee's Summit, June 18, 1899] (N). Jasper Co.: Demaree 39338 (Z). Jefferson Co.: Hasse s.n. [May 14, 1887] (N), s.n. [June 1887] (Du—90901). Johnson Co.: E. J. Palmer 55904 (Lb—50951). Lawrence Co.: Spillman 298 (Pl—22609). Lincoln Co.: J. Davis 6074 (Du—87289), 6432 (Vi), s.n. [Silex, 29-5-15] (Au), s. n. [Whiteside, 1-6-15] (Mi), s.n. [Whiteside, 18-9-15] (Gg—31270), s.n. [7-6-16] (Vt). Macon Co.: B. F. Bush 7586a (N, Ur). Miller Co.: Damon s.n. [Kaiser, May 26, 1939] (Lb—34762); A. R. Moldenke 855 (Lw); Steyermark 13056 (Ky). Montgomery Co.: Drouet s.n. [June 6, 1931] (Lb—9184); C. O. Erlanson 1701a (Mi); Steyermark 77485 (Lb—43267). Phelps Co.: Fleenor s.n. [May 21, 1933] (Lb—11716); Meek s.n. [Rolla, 7-19-89] (Io—15340, Io—22905). Pike Co.: J. Davis 370 (W—503460). Polk Co.: Steyermark 24049 (N). Reynolds Co.: Rickett s.n. [Aug. 18, 1927] (Lb—4173). Saint Louis Co.: Eggert s.n. [12 Aug. 1875] (Cm); Engelmann 336 (Pr), s.n. [July 1839] (Br, Br, Br); C. Epling 6814 (La); Glatfelter s. n. [near St. Louis, 6-30-92] (Mi); M. Martens s.n. (Br). Stone Co.: E. J. Palmer 5769 (Po—217513, W—1581046). Taney Co.: D. Spencer 35 (Lb—35371), s.n. [8.1.40] (Lb—48913). Washington Co.: Brinker 708 (I). Wright Co.: Lansing 2976 (Ur), 3135 (Ur). County undetermined: Z. Baldwin s.n. (Au); Engelmann s.n. [Dapprich 7768] (Sm). Saint Louis: J. A. Drushel 4888 (Gg—216418); Engelmann s.n. [St. Louis, Sept. 1841] (W), s.n. [St. Louis] (S); F. E. McDonald s.n. [St. Louis, June 1886] (Ca—192066, Ur). ARKANSAS: Baxter Co.: Demaree 28939 (Au—122692, Hi—51456, N, Ok, We). Benton Co.: Heacox s.n. [July 20, '89] (Ob—50756). Carroll Co.: E. J. Palmer 44494 (W—1828079). Clark Co.: Demaree 17178 (N), 17808 (N). Craighead Co.: Demaree 27792 (N). Fulton Co.: Demaree 30805 (Au—122688, Le, St). Independence Co.: Demaree 26752 (Au—122689, Lb—47028, N, Ok, St). Izard Co.: F. W. Pennell 10698 (N); A. Robinson 1792 (Lw). Lawrence Co.: Demaree 26179 (N), 30447 (N); Rolfs s.n. [8/91] (Io—44894). Marion Co.: Demaree 29249 (Au—122687, Hi—51438, Mi, N, Ok, We), 47947 (Lw). Randolph Co.: Demaree 30955 (Le). Searcy Co.: R. Bebb 4027 (Ok, Ok). Sebastian Co.: Ayers s.n. [Fort Smith, 1880] (Mi). Sharp Co.: Demaree 26112a (Le), 26271 (N); D. B. Dunn 12814 (Lb—39845). Stone Co.: Demaree 27876 (Au—122686, N). Washington Co.: B. J. Turner s.n. [Summer 1939] (Au). County undetermined: F. L. Harvey s.n. [N. W. Ark.] (Ka). NEBRASKA: Banner Co.: Rydberg 154 (N). Lancaster Co.: J. L. Sheldon s.n. [Lincoln, August 20, 1902] (We). OKLAHOMA: Adair Co.: C. S. Wallis 2386 (St). Bryan Co.: C. S. Sheldon 49 (W). Cherokee Co.: R. Bebb 4371 (Ok, Ok); C. S. Wallis 440 (St), 535 (St), 720 (St). Choctaw Co.: Ripley & Barneby 7435 (N); Smith & Randel 69 (Ok); Waterfall 8901 (Ok).

Craig Co.: Waterfall 6852 (Ok). Delaware Co.: C. S. Wallis 2296 (St), 2440 (St), 3258 (St), 4199 (St). Harmon Co.: Demaree 12216 (Ok--22237). Leflore Co.: "R. E. J." s.n. [Winding Stair Mts., 7/3/19] (Ok--10262). Mayes Co.: Coryell 946 (St). McCurtain Co.: H. W. Houghton 3622 (N), 3646 (N); Little & Olmsted 104 (Ok--10263, Ok--10264). Murray Co.: D. C. Harper 52 (St--23058). Muskogee Co.: E. L. Little 1584 (Ok--10267), 1785 (Ok--10265), 2346 (Ok--10266). Osage Co.: G. W. Stevens A.1980 (St--9205); Van Vleet 434 (Ok--20509); Waterfall 8179 (Ok). Ottawa Co.: G. W. Stevens 2299 (N, Ur), A.2299 (St--9206). Payne Co.: Van Vleet 399, in part (Ok--20508), s.n. [Yale, 6-25-05] (Ok--10315). Pontotoc Co.: D. McCoy 605 (St), 2802 (St). Rogers Co.: Waterfall 1453 (Ok, St), 1469 (St). Wagoner Co.: R. Bebb 4324 (Ok). Washington Co.: G. W. Stevens A.2080 (St--9204). County undetermined: Burrill s.n. [Indian Territory] (H--106463). UNITED STATES: State undetermined: Rafinesque s.n. [13.1.41] (N); Torrey & Gray s.n. [Southern United States] (Br). CULTIVATED: Belgium: Herb. Hort. Brux. s.n. (Br); Herb. Jard. Bot. Brux. s.n. (Br); Lejeune s.n. [1822] (Br), s.n. [1836] (Br), s.n. (Br); M. Martens s.n. [1834] (Br), s.n. (Br). Czechoslovakia: M. Martens s.n. (Br). France: Herb. Decaisne s.n. [h. P. 1832] (Br, Br); Herb. W. H. Harvey s. n. [h. R. P., Aug. 1846] (Du--176520). Germany: Bouché s.n. [Herb. Prager 18638] (Gg--31456); Herb. Mus. Bot. Stockholm s.n. [herb. Hamb.] (S); Herb. Vigener s.n. [Botan. Garten Heidelberg] (La). Spain: Collector undesignated s.n. [1814] (Q); Herb. Hort. Reg. Matrit. 3 (Q), 42 (Q). Sweden: Herb. Mus. Bot. Stockholm s.n. (S); Wallberg s.n. [ex Hort. Proprio 1802] (Lu). Switzerland: Herb. Hort. Bot. Basil. s.n. [Aug. 1838] (C). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. [8/9] (Cn), s. n. (Pu, Pu); Herb. Coll. Pharmacy s.n. (Pa); Herb. Harvey s.n. (Du--166464); Herb. Mus. Bot. Stockholm s.n. (S); Herb. F. Philippi s.n. [Am. S.] (Sg--25560); Lesquereux 462 [N. Amer.] (Gg--31268); MacCallum s.n. [Bartlett Springs, Aug. 1905] (Gg--14486); Pitcher s.n. [1842] (T); J. Torrey s.n. (S); A. Wood s.n. (Pa). MOUNTED CLIPPINGS: Lehm., Nov. Act. K. Deut. Akad. Naturf. Halle 14 (2): 524. 1825 (W).

VERBENA SIMPLEX f. ALBIFLORA Moldenke, Résumé Suppl. 10: 1, nom. nud. 1964; Phytologia 10: 172. 1964.

Bibliography: Moldenke, Résumé Suppl. 10: 1. 1964; Moldenke, Phytologia 10: 172. 1964.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Ronald Leighton McGregor (no. 13217) scattered in low places in shallow soil over limestone in native bluestem prairie hay meadow 2 miles south of Elsmore, Allen County, Kansas, on July 22, 1957, and is deposited in the herbarium of the University of Kansas at Lawrence. The form is known thus far only from the type specimen.

Citations: KANSAS: Allen Co.: R. L. McGregor 13217 (Lw—type).

VERBENA SIMPLEX var. EGGERTI Moldenke, Am. Midl. Nat. 24: 753. 1940.

Synonymy: Verbena simplex x hastata Gates, Fl. Kans. 190, in part. 1940. Verbena simplex eggerti Moldenke, Résumé Suppl. 7: 10, in syn. 1963.

Bibliography: F. C. Gates, Fl. Kans. 190. 1940; Moldenke, Am. Midl. Nat. 24: 753. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 9 & 102. 1942; Moldenke, Castanea 10: 38 & 39. 1945; Moldenke, Alph. List Cit. 1: 181 (1946) and 2: 405 & 587. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 17 & 199. 1949; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 131 (1952) and pr. 2, 3: 131. 1958; Moldenke, Résumé 21, 22, 374, & 474. 1959; Moldenke, Phytologia 8: 245. 1962; Moldenke, Résumé Suppl. 7: 2 & 10. 1963; Moldenke, Phytologia 10: 174. 1964.

This variety differs from the typical form of the species in being abundantly branched from the base, with up to 35 branches per plant, each terminating in an elongated densely many-flowered spike.

The type of the variety was collected by Heinrich Karl Daniel Eggert at Pacific, Franklin County, Missouri, on July 4, 1896, and is deposited in the Britton Herbarium at the New York Botanical Garden. The D. J. Johnson s.n., cited below, was regarded by Gates (1940) as V. simplex x hastata, but does not seem to me to represent that hybrid. On the other hand, the rather large, many-branched, many-spiked specimens cited by me under V. simplex may actually represent var. eggerti. Among them are Shacklette 609 (Ky) from Union County, Kentucky; Eggert s.n. [12 Aug. 1875] (Cm) from Saint Louis County, Missouri; Koenig s.n. [July 1878] (Cm) from Hampshire County, West Virginia; Ruth s.n. [Knoxville, June 1900] (Dt) from Knox County, Tennessee; and Guttenberg s.n. [Sept. 10, '79] (Cm) from Erie County, Pennsylvania. It is very probable that V. multicaulis Raf. also belongs here.

The variety has been misidentified in herbaria and distributed under the names V. angustifolia Michx. and V. simplex Lehm. It has been collected along railroad tracks and "in grassy open woods, level area 20 feet from creek", flowering in June and September, and fruiting in September. Hayden found it growing in proximity to xV. moechina Moldenke and says that compared to the latter "this material seems to be typical Verbena angustifolia." The Gleason 8845 collection appears to be a mixture with typical V. simplex.

In all, besides the specimens mentioned above, 6 herbarium specimens, including the types of all the names involved, and one mounted clipping have been examined by me.

Citations: IOWA: Cerro Gordo Co.: A. Hayden 2 (N, N). KENTUCKY: Bell Co.: H. A. Gleason 8845, in part (N). KANSAS: Butler Co.: D. J. Johnson s.n. [August 1926] (Ka--71717). MISSOURI: Franklin Co.: Eggert s.n. [Pacific, 4 July 1896] (Ca--183208--isotype, N--type). MOUNTED CLIPPINGS: Moldenke, Am. Midl. Nat. 24: 753. 1940 (W).

xVERBENA SOLBRIGII Moldenke, Phytologia 7: 85. 1959.

Synonymy: Glandularia laciniata x peruviana Schnack & Solbrig, Revist. Fac. Agron. La Plata 29: 255--266, fig. 1--4. 1953.

Bibliography: Schnack & Solbrig, Revist. Fac. Agron. La Plata 29: 255--266, fig. 1--4. 1953; Moldenke, Phytologia 7: 85. 1959; Moldenke, Résumé Suppl. 1: 15, 18, 23, & 25. 1959; Moldenke, Phytologia 8: 121. 1961.

Illustrations: Schnack & Solbrig, Revist. Fac. Agron. La Plata 29: 255--266, fig. 1--4. 1953.

This is the hybrid between Verbena tenuisecta Briq. and V. peruviana (L.) Britton, produced artificially in Argentina in 1951. The original statement about its origin is "El híbrido Glandularia laciniata x G. peruviana fué obtenido por ono de nosotros en el Instituto Fitotécnico de Santa Catalina [Zárata, prov. Buenos Aires] en el año 1951; posteriormente se obturo el correspondiente anfidiploide por tratamiento con colchicina."

The two parental species occur together in the wild in at least one state of Brazil, in Paraguay, Uruguay, and nine provinces of Argentina, so the hybrid is likely to be encountered there. It should have considerable horticultural merit, since both parental species are extremely showy.

VERBENA SPECTABILIS Moldenke, Phytologia 2: 426--427. 1948.

Bibliography: Moldenke, Phytologia 2: 426--427. 1948; Moldenke, Castanea 13: 119. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 107 & 199. 1949; Moldenke, Alph. List Cit. 4: 1256. 1949; Moldenke, Phytologia 3: 306. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 128 & 474. 1959; Moldenke, Résumé Suppl. 1: 7. 1959.

Herb, to 50 cm. tall; stems rather short, obtusely tetragonal, mostly branched at or near the base, rather densely short-pubescent with reflexed brownish hairs; branches slender, erect or ascending, rather obtusely tetragonal, usually sulcate between the angles, densely short-pubescent with reflexed sordid-gray hairs; nodes annulate; principal internodes 2--4 cm. long; leaves decussate-opposite; petioles very short or usually obsolete; leaf-blades chartaceous, rather uniformly green on both surfaces, ovate, 2.5--4 cm. long, 0.8--2 cm. wide, acute at the apex, acuminately narrowed into the broadly winged petiole at the base, irregularly dentate or occasionally subincised from the apex to the widest point, the lowest teeth sometimes lobe-like and divergent on larger leaves, rather densely appressed-strigose above, appressed short-pubescent beneath; midrib and the 5--8 pairs of secondaries very slender, usually impressed above, prominulous beneath, the secondaries rather straight, ascending, branching at the apex and a branch extending to the tip of each tooth; inflorescence terminal and in the uppermost leaf-axils, congested-spicate, the floriferous portion 2.5--3.5 cm. long, densely many-flowered, apparently not elongating after anthesis; peduncles slender, 3--6.5 cm. long, densely short-pubescent with reflexed whitish hairs, often joined at about the midpoint and there bearing a pair of lanceolate bracts 7--8 mm. long; floral bractlets lanceolate, about 4 mm. long, about 1 mm. wide at the base (or narrower), attenuate at the apex, closely appressed to the calyx, densely short-pubescent with spreading whitish hairs; calyx cylindric, about 9 mm. long, 5-costate, densely short-pubescent with spreading whitish hairs, its rim unequally aristate-toothed, purplish, the longer appendages about 1 mm. long, often twisted-connivent before and after anthesis; corolla hypocrateriform, violet or purple, showy, its tube 10--15 mm. long, rather densely puberulent above the calyx on the outside, the limb about 9 mm. wide.

The type of this handsome species was collected by Erik Leonard Ekman (no. 1980) along a small stream called Magdalena at Loreto, Posadas, Misiones, Argentina, on February 6, 1908, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The species has also been found on low ground and on campos along the edge of rivers, flowering in February and July.

In all, 8 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: ARGENTINA: Chaco: T. Rojas 11785 (N, S). Corrientes: Pedersen 4484 (Hi--193799, N, S, W--2283422). Misiones: Ekman 1980 (F--photo of type, N--isotype, N--photo of type, S--type, Si--photo of type, Z--photo of type).

VERBENA SPHAEROCARPA Perry, Ann. Mo. Bot. Gard. 20: 256--257. 1933.

Bibliography: I. M. Johnston, Proc. Calif. Acad. Sci., ser. 4, 20: 88. 1931; Perry, Ann. Mo. Bot. Gard. 20: 243, 249, 250, 252, 256--257, & 356. 1933; A. W. Hill, Ind. Kew. Suppl. 9: 295. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 102. 1942; Moldenke, Alph. List Cit. 1: 30 (1946) and 2: 469. 1948; Moldenke, Castanea 13: 114. 1948; Moldenke, Alph. List Cit. 3: 712, 800, & 951 (1949) and 4: 1166, 1224, & 1229. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33, 34, & 199. 1949; Moldenke, Résumé 40 & 474. 1959; Moldenke, Phytologia 8: 257 & 406 (1962), 8: 463 (1963), and 9: 194. 1964.

Annual or biennial herb, to 1 m. tall; stems erect, tetragonal, branched above, glabrous or sparsely scabrous-pubescent; petioles short; leaf-blades oblong, 3--10 cm. long, acute at the apex, tapering into the petiole at the base, sharply serrate along the margins or the upper ones often entire, scabrous-pubescent above with the hairs minutely bulbous-based, more or less short-strigillose on both surfaces, prominently venose beneath; peduncles to

9 cm. long; spikes sometimes short and dense, subsessile or short-pedunculate, or to 4 cm. long, cymosely arranged; bractlets ovate-lanceolate, shorter than the calyx, acute at the apex, pubescent; calyx scarcely 2 mm. long, connivent over the schizocarp, appressed-pubescent, the teeth very short, subacute at the apex; corolla hypocrateriform, light-pink or bluish-white, its tube protruding slightly beyond the calyx, the limb 1.5--2 mm. wide; schizocarp about 1 mm. long and 1 mm. wide; cocci very faintly striate or essentially smooth, the commissural faces muricately scabrous.

The type of this strange endemic species was collected by Alfred Webster Anthony (no. 380) on Socorro Island, Colima, Mexico, between March and June, 1897, and is deposited in the herbarium of the Missouri Botanical Garden at St. Louis. The species has been found on rocky soil, flowering and fruiting from May to July. Material has been misidentified and distributed in herbaria as V. bonariensis L. and V. litoralis H.B.K.

Reid Moran, in a letter to me dated September 13, 1959, says "My specimens differ from Perry's description in having longer spikes, sometimes to 4 cm. long, borne on peduncles as long as 9 cm. According to my notes the corollas were light pink, though Mason, as quoted by Johnston.....said bluish-white."

Perry (1933) cites the following 4 additional specimens not as yet seen by me: REVILLAGIGEDO ISLANDS: Socorro: A. W. Anthony 380 (E--type, G--isotype); Barkelew 231 (E, G). She says "This endemic from Socorro Island is most nearly related to V. litoralis and has a similar habit, but is easily separated on the distinctive characters of the inflorescence. The spikes are shorter and denser, the flowers are smaller and so crowded that the lower ones appear to be inserted at right angles to the rachis of the spike; moreover, the schizocarp is fully as broad as or even broader than long, an unusual trait not found elsewhere in the North American species of Verbena."

In all, 16 herbarium specimens, including the type collection, have been examined by me.

Citations: REVILLAGIGEDO ISLANDS: Socorro: A. W. Anthony 380 (Ca--104821--isotype, Du--9550--isotype, W--313934--isotype); Barkelew 231 (Ca--138828, Du--90887, Du--91163, N, Po--64645, W--399024); H. L. Mason 1612 (Gg--186593, W--1569662); Patiño 7138 (Me); O. Solís 20 (Me, W--1265394), 70 (W--1268885), s.n. [9 Mayo 1925] (Me).

VERBENA STACHYS Raimondi, Bol. Mus. Hist. Nat. Jav. Prado 7: 242, hyponym. 1943.

Bibliography: Raimondi, Bol. Mus. Hist. Nat. Jav. Prado 7: 242. 1943; Moldenke, Castanea 10: 41. 1945; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 74 & 199. 1949; Moldenke, Résumé 85 & 474. 1959.

Nothing is known to me of this plant except that the type is an unnumbered collection made by Antonio Raimondi at Chanchamayo, in the province of Tarma, Junín, Peru, in 1855.

VERBENA STELLARIOIDES Cham., Linnaea 7: 264--265. 1832.

Synonymy: Verbena stellarioides α decurrens Cham., Linnaea 7: 265. 1832. Verbena morongii Britton, Ann. N. Y. Acad. Sci. 7: 198. 1893. Verbena decurrens (Cham.) Kuntze, Rev. Gen. Pl. 3 (2): 257. 1898 [not V. decurrens Moench, 1947]. Verbena stellarioides var. decurrens Cham. ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Glandularia stellarioides (Cham.) Schnack & Covas, Bol. Soc. Argent. Bot. 1: 284. 1946.

Bibliography: Cham., Linnaea 7: 264--265. 1832; Steud., Nom. Bot., ed. 2, 2: 750. 1841; D. Dietr., Syn. Pl. 3: 602. 1843; Walp., Repert. 4: 26. 1845; Schau. in A. DC., Prodr. 11: 540--541. 1847; Schau. in Mart., Fl. Bras. 9: 186. 1851; Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 192 & 198. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Kuntze, Rev. Gen. Pl. 3 (2): 257. 1898; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Herter, Florula Urug. 105. 1930; Herter, Revist. Sudam. Bot. 4: 186--187. 1937; Moldenke, Prelim. Alph. List Invalid Names 47. 1940; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke, Alph. List Invalid Names 49 & 50. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 41, & 102. 1942; Schnack & Covas, Bol. Soc. Argent. Bot. 1: 284. 1946; Troncoso & Burkart, Darwiniana 7: 211, fig. 2a, 214, & 215. 1946; Augusto, Fl. Rio Grande do Sul 209 & 232. 1946; Moldenke, Alph. List Cit. 1: 201 & 263. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10 & 23. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 73. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 99, & 199. 1949; Moldenke, Alph. List Cit. 3: 688 & 923. 1949; Moldenke, Phytologia 3: 289 & 378. 1950; Schnack & Covas, Revist. Argent. Agron. 18: 107--108, fig. 1 A--F. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Moldenke, Résumé 111, 118, 120, 128, 296, 363, 370, 374, & 474. 1959; Moldenke, Résumé Suppl. 2: 13 (1960) and 7: 6. 1963; Moldenke, Phytologia 9: 130 (1963), 10: 159 & 160 (1964), and 11: 141 & 142. 1964.

Illustrations: Troncoso & Burkart, Darwiniana 7: 211, fig. 2a. 1946; Schnack & Covas, Revist. Argent. Agron. 18: 107--108, fig. 1 A--F. 1951.

Suffrutescent perennial herb, with the habit of Stellaria holostea; rhizomes creeping:stems herbaceous, erect, 40 cm. to 1 m. tall, slender, tetragonal, varying from simple to branched, sharply margined, glabrous; branches elongate, fastigiate; terminal internode subvillous; leaves decurrent, erect-patulous, linear, narrowed to an acute apex, entire, 1-nerved, glabrous, the margins reflexed; spikes terminal, congested, at first fastigiate, later elongate and finally cylindric, solitary and simple or a few crowded together; bractlets lanceolate, colored, about 1 cm. long, surpassing the calyx, subulate-acuminate at the apex, villous-ciliate; flowers large, odorless; calyx membranous, colored, tubular, about 6 mm. long, 5-ribbed, villous on the angles, the teeth 5, subulate-aristate, ascending, the 2 lower ones larger, the 2 lateral ones somewhat shorter, the uppermost one short; corolla large, hypocrateriform, varying from lilac, purple or violet to blue-violet, blue-purple, or blue, villous-lanuginous on the outer surface, its tube about 12 mm. long, twice as long as the calyx-tube, ampliate above, villous within, the limb almost 1 cm. wide, spotted in the throat, 5-parted; stamens 4, didynamous, inserted slightly below the mouth of the corolla-tube; filaments short; anthers cordate-ovate; style setaceous or capillary, equaling the stamens, elongate and exserted from the calyx after the falling of the corolla, clavate-incrassate at the apex; stigma subapical, with an adjacent, minute, oblique, acute horn; fruiting-spikes about 5 cm. long, cylindric, lax at the base; fruit oblong, about 4 mm. long, slightly thickened at the base; cocci linear, obtuse, convex and elegantly areolate on the back, the areoles quadrangular, the commissural surface angulate, smooth; chromosome number: x = 5.

The type of this species was collected by Friedrich Sellow in grassy campos at Rio Jacuy near Banhado, Rio Grande do Sul, Brazil, and was deposited in the herbarium of the Botanisches Museum at Berlin before World War II, now destroyed, but fortunately represented by Macbride's type photograph no. 17446. I regard this photographed specimen also as the type of var. decurrens, the typical variety. I follow Schauer in regarding var. decurrens as a synonym of the typical form of the species. The so-called var. sessilis Cham. I regard as V. sessilis (Cham.) Kuntze. The two species are not very clearly defined, but, in general, V. stellarioides has the leaves decurrent, linear, entire, and glabrous (or strigose on the margins only), and the bractlets longer than the calyx, while in V. sessilis the leaves are merely sessile, narrow-lanceolate, obsoletely serrate, and sparsely strigillose, and the bractlets are shorter than the calyx. The bractlet length seems, however, to be the only reliable character.

The type of V. morongii was collected by Thomas Morong (no. 600) -- in whose honor it is named -- along railroad tracks at Caballero, Paraguay, on January 20, 1889, and is deposited in the Columbia University herbarium at the New York Botanical Garden. Verbena morongii was regarded as conspecific with V. sessilis by me in my 1940 publication.

Verbena stellarioides has been found in swamps and open places, fields and moist grassy fields, in foggy places, on low or wet campos, among palms, along railroad tracks, and on grasslands on low occasionally flooded ground, flowering and fruiting from October to January and in April and May. Schulz reports it as rather abundant at Colonia Benítez in Chaco, while Jörgensen says that it is also common in open places in Paraguay.

Walpers (1845) classifies this species in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Melindres, along with ten other species. It should be noted here that the V. decurrens of Moench is a synonym of Stachytarpheta jamaicensis (L.) Vahl. While this binomial is accredited to Moench, actually Verbena is mentioned by him in his Meth. (1794) only on pages 368, 369, & 423 and no such binomial is mentioned there. In his Suppl. Meth. Pl. the genus is mentioned on pages 131, 150, & 327 (1802) and no such binomial occurs there, either; however, on page 150 he describes a Vermicularia decurrens as a new name for Stachytarpheta jamaicensis. "Verbena decurrens" is given in Kuntze, Rev. Gen. Pl. 3 (2): 257 (1898) with "(Cham.)" implied. The Morong, Britton, & Vail reference in the bibliography above is often credited to Britton alone and erroneously dated "1892".

Troncoso & Burkart (1946) say: "V. stellarioides posee espigas terminales solitarias, rara vez hasta 2 ó 3 espigas por vástago... inflorescencia capituliforme durante la antesis; intermodio terminal (debajo de la espiga) visiblemente velloso; flores mucho mayores [as compared to V. tristachya], con limbo amplio y extendido, tubo corolar exteriormente velloso-lanuginoso; brácteas muy subuladas, más largas que el cáliz, velloso-ciliadas; cáliz velloso en los ángulos......V. stellarioides posee también tallo completamente fistuloso, aunque de cavidad menor....el estilo..... en V. stellarioides es 10 veces y media mayor (que el ovario)."

Material of V. stellarioides has been misidentified and distributed in herbaria under the names V. littoralis Kunth, V. sessilis Kuntze, and V. stellarioides sessilis Cham., while Rojas 1680 was called "V. stellarioides Cham. sensu lato" by Hassler.

Schauer (1847, 1851) gives V. montevidensis Spreng. as a synonym of V. stellarioides with a question and the qualifying remark "ex diagnosi", but Sprengel's name actually applies to a very different species, which see. Schauer says of V. stellarioides "Planta conspicua, facie Stellariae Holosteae haud omnino dissimilis, sed firmior." Chamisso (1832) says "cyma hac lege ter dichotoma inter multa unispicata specimina occurrit; nex omnino desunt trifurcationis specimina". Of the spikes he says "casu truncati ramis axillaribus sui similibus renovati, sic ramis oppositis bifurci; bifurci etiam rarius ex inflorescentia, ramis e summorum foliorum axillis evolutis foliosis spiciferis spicam primariam alarem comitantibus" and of the cocci he notes "color illi griseus pallide nigrescens. Carpello dorso octonervia, faciebus albidis nudiusculis, angulo faciale nervoso."

Schnack & Covas (1951) studied the chromosome complement of this species and of V. tristachya Troncoso & Burkart and report "En G. stellarioides, sobre la unica planta obtenida de semillas coleccionadas por el Ing. L. B. Mazoti en Ituzaingo (provincia de Corrientes), hemos costatado en microsporocitos y en celulas somaticas 5 pares de cromosomas y un fragmento centrico libre.... En todas las metafases mitoticas observadas esta presente el fragmento, lo que indica que se divide en cada mitosis. En el proceso meiotico se observo que el fragmento pasa a formar parte de unto de los nucleos hijos derivados de la primera division meiotica; no hemos observado los resultados de la segunda division meiotica, pero es presumible que en ella el fragmento se divide ecuacionalmente. En un caso se verifico en prometafase I la presencia de 4 bivalentes, 2 monovalentes y un fragmento....De cualquier modo, para el proposito de esta comunicacion lo importante es que G. stellarioides posee el numero basico de cromosomas x = 5. En resumen, los numeros cromosomicos observados confirman la ubicacion de ambas especies en genero Glandularia y refirman la validez de dicho genero."

Augusto (1946) also cites a Herter collection from Cerro Largo, Uruguay, not as yet seen by me. In all, 28 herbarium specimens and 6 mounted illustrations, including type or phototype material of all the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Jürgens 22 (B); Rambo 10156 (Rb); Schreiner s.n. (Ja--46575, N); Sellow s.n. [Macbride photos 17446] (Kr--photo of type, N--photo of type, N--photo of type). PARAGUAY: Jörgensen 3773 [Herb. Osten 22241] (Cp, Du--197836, N, N--photo, N--photo, S, Ug, W--1483812, Z--photo); Kuntze s.n. [Nord Paraguay, Sept. 1892] (N); Morong 600 (C); Pedersen 4262 (W--2283742); Rojas 1680 [Herb. Hassler 1680; Herb. Osten 8641] (N, Ug), 2527 [Herb. Osten 18184] (N, Ug). URUGUAY: Arechavaleta 18 (N, Ug, Ug, Ug), 36 (Ug), s.n. [Tacuarembó, Nov. 1903] (Ug); Cantera s.n. [Arechavaleta 18a] (Ug). ARGENTINA: Chaco: A. G. Schulz 285 [Herb. Osten 23149] (N, Ug), 1468 (It, N).

VERBENA STEWARTII Moldenke, Phytologia 2: 56--57. 1941.

Bibliography: Moldenke, Phytologia 2: 56--57. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 102. 1942; Moldenke, Castanea 13: 116. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Alph. List Cit. 3: 972. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 199. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 81 & 474. 1959.

Herb, more or less nigrescent in drying; stems and branches very slender, the latter almost filiform, sharply tetragonal, glabrous and shiny throughout; nodes annulate; principal internodes mostly elongated, 2--6 cm. long; leaves decussate-opposite, sessile, the upper ones linear, the lower ones with 2 or 3 linear widely divergent lobes, revolute-margined, blunt-pointed, more or less sparsely scattered-pilose with appressed whitish antrorse hairs on both surfaces; midrib prominent beneath; inflorescence terminal, spicate, rather few-flowered, dense toward the apex and during anthesis, the lower flowers often scattered after anthesis; peduncles slender, elongated, 6.5--7.5 cm. long, glabrous and shiny; rachis filiform, glabrous and shiny or very obscurely scattered-pulverulent; bractlets lanceolate, 1.5--2 mm. long, acuminate at the apex, glabrous except for the ciliolate margins; calyx tubular, about 2 mm. long, minutely appressed-puberulent;

corolla hypocrateriform, barely exceeding the calyx, its tube usually only about 2 mm. long, the limb about 1.5 mm. wide.

The type of this remarkable species was collected by Alban Stewart (no. 3320) -- in whose honor it is named -- at Tagus Cove, Albemarle Island, Galapagos Islands, on March 27, 1906, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector states that the species is common in lava beds at 300 feet altitude. It has been misidentified and distributed in herbaria as V. litoralis H.B.K., while the Bishop Museum isotype is actually mounted on the same herbarium sheet as Stewart 3319, which is V. galapagosensis Moldenke.

Verbena stewartii has been found in flower and fruit in March. In all, 3 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Albemarle: A. Stewart 3320 (Bi--isotype, F--photo of isotype, Gg--31381--isotype, N--type, N--photo of isotype, Si--photo of isotype, Z--photo of isotype).

VERBENA STOREOCLADA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1060--1061. 1904.

Synonymy: Verbena erinoides Chod. (in part) ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1060, in syn. 1904 [not V. erinoides Auth., 1959, nor Hook., 1934, nor Hook. & Arn., 1959, nor H.B.K., 1963, nor Lam., 1791, nor L. ex Lorentz & Niederlein, 1881, nor L. ex Walp., 1843, nor Poepp., 1847, nor Spreng., 1830, nor Willd., 1947]. Verbena crinoides Chod. (in part) ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059 & 1060, in syn. 1904. Verbena stereoclada Briq. ex Angely, Fl. Paran. 16: 79, sphalm. 1960. Verbena humilis Cham. ex Moldenke, Résumé Suppl. 7: 9, in syn. 1963.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059--1061. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 482. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 102. 1942; Moldenke, Alph. List Cit. 1: 263. 1946; Moldenke, Phytologia 2: 337 & 386. 1947; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 3: 693, 704, & 766 (1949) and 4: 1080 & 1172. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 99, 100, 107, & 109. 1949; Moldenke, Phytologia 3: 289. 1950; Stellfeld, Trib. Farmac. 19 (10): 167. 1951; Angely, Fl. Paran. 7: 13. 1957; Moldenke, Résumé 111, 118, 120, 128, 363, & 474. 1959; Angely, Fl. Paran. 16: 79 (1960) and 17: 47. 1961; Moldenke, Résumé Suppl. 3: 41. 1962; Moldenke, Phytologia 8: 202, 417, & 420 (1962) and 9: 12, 67, & 70. 1963; Moldenke, Résumé Suppl. 7: 9. 1963; Moldenke, Phytologia 9: 388 & 393. 1964.

Herb. 20--40 cm. tall; stems many from a single root, rather weak, procumbent, somewhat angled, branched; branches divergent-ascending, green, sparsely retrorsely pubescent; middle internodes 2--6 cm. long; petioles to 1 cm. long, winged, often appearing falsely pinnate-auriculate because of smaller axillary leaves at their base; leaf-blades green on both surfaces, ovate in outline, 3--4 cm. long, 1.5--2 cm. wide, obtuse or subobtuse at the apex, broadly cuneately decurrent into the short petiole at the base, pinnately lobed with the lobes obtusely crenate-serrate, often rather wide, sparsely antrorsely substrigose-pubescent above, glabrescent beneath except for the prominulous veins; inflorescence spicate, more or less pedunculate; peduncles slender; spikes terminal, finally elongate to 4 cm., congested; bractlets lanceolate, about 5 mm. long, shorter than the calyx, sparsely pubescent on the back, ciliate-pubescent along the margins, spreading after anthesis; calyx tubular, about 7 mm. long, densely pilose with short spreading or slightly ascending hairs, urceolate after anthesis, the tube about 5 mm. long, the mouth oblique, the teeth setaceous, unequal, the 2 anterior ones longer, about 2 mm. long, the rest 1--1.5 mm. long, all finally connivent; corolla hypocrateriform, rose or violet, surpassing the calyx-teeth by 1--2 mm., puberulent on the outside, its tube regular, cylindric, somewhat exserted, the limb spreading, 5--6 mm. wide, the lobes obcordate, the larger ones about 2 mm. long and 3 mm. wide, emarginate to 1 mm. at the apex; stamens and pistil normal for the genus; style exserted after anthesis; cocci sublinear-oblong, about 2.5 mm. long and 0.7 mm. wide, raised-reticulate on the back, finally foveolate and brown.

The type of this species was collected by Emil Hassler (no. 4489) in fields near Rio Corrientes, Paraguay, in September, deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Briquet comments that "Cette espèce est très voisine de la précédente [V. calliantha]. Elle s'en distingue cependant par ses tiges et rameaux procombants plus grêles, par sa tige couverte de poils défléchis et non pas étalés-ascendants, par la forme de l'indument des feuilles, par ses bractées relativement plus longues, par son calice plus court et par sa corolla plus petite à tube à peine exsert."

The name, V. humilis, seems to be based on Malme 1322 from sandy rather wet fields at Cachoeira, Rio Grande do Sul, Brazil, collected on February 2, 1902, and deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

It should be noted here that V. erinoides and V. crinoides of Chodat are also in part V. calliantha Briq.; the V. erinoides of "Auth." is V. dissecta Willd., that of Humboldt, Bonpland, & Kunth is V. ciliata Benth., that of Linnaeus [ex Walpers] and of Lamarck is V. laciniata (L.) Briq., that of Willdenow is V. laciniata var. contracta (Lindl.) Moldenke, and that of Hooker, of Hooker & Arnott, of Poeppig, of Sprengel, and of Linnaeus [ex Lorentz & Niederlein] is V. berterii (Meisn.) Schau. Macbride's photograph no. 24698, cited below, is of a specimen depoisted in the Delessert Herbarium at Geneva.

Verbena storeoclada has been found in fields and in sandy rather wet fields, at altitudes of 1100 to 1200 meters, flowering from January to March and in June and September. In all, 12 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: Tessmann 3701 [Herb. Mus. Paran. 3701] (N). Rio Grande do Sul: Malme 1322 (S); J. Vidal s.n. [near city of Torres, Feb. 1939; Herb. Mus. Nac. Rio de Jan. 46544] (N), s.n. [Bocca do Monte, March 1939] (Ja--46546). Santa Catarina: Smith & Reitz 10193 (W--2251660, Z). PARAGUAY: Hassler 4489 [Macbride photos 24698] (Ca--935083--isotype, Kr--photo of type, N--isotype, N--photo of type). URUGUAY: Née 84 (N, Q). ARGENTINA: Santiago del Estero: H. H. Bartlett 20452 (Mi, W--1907605).

VERBENA STRICTA Vent., Descr. Pl. Jard. Cels. 53, pl. 53. 1800.

Synonymy: Verbena alopecurus Cav., Descr. 68. 1802. Verbena rigens Michx., Fl. Bor.-Am., ed. 1, 2: 14. 1803. Verbena foliis ovato-oblongis, crenato-serratis ramisque pilosis Vahl apud Poir. in Lam., Encycl. Méth. Bot. 8: 549, in syn. 1808. Verbena (rigens), caulibus rigidè erectis; foliis obovalibus, subtomentoso-hirsutissimis; spicis imbricatis Michx. apud Poir. in Lam., Encycl. Méth. Bot. 8: 549, in syn. 1808. Verbena (stricta), hirsuta, albicans, spicis cylindraceis; foliis subsessilibus, ovatis, serratis; caulibus strictis, teretibus Vent. apud Poir. in Lam., Encycl. Méth. Bot. 8: 549, in syn. 1808. Verbena cuneifolia Raf., Med. Repos. N. Y., ser. 2, 5: 360. 1808; Journ. Bot. [Paris] 1: 228. 1809. Verbena ringens Raf., First Cat. Bot. Gard. Transylv. Univ. 16, nom. nud. 1824; Herb. Raf. 61, nom. nud. 1833. Verbena stricta β mollis Torr., Ann. Lyc. N. Y. 2: 234. 1827. Verbena mollis Raf., Atl. Journ. 1: 146. 1832. Verbena scoparia Tausch, Flora 19: 390. 1836 [not V. scoparia Gill. & Hook., 1829, nor Hook., 1947]. Verbena stricta var. mollis Torr. ex Eaton & Wright, N. Am. Bot., ed. 8, 470. 1840. Verbena alopecuroides Hort. ex Steud., Nom. Bot., ed. 2, 2: 749, in syn. 1841. Verbena alopecurioides Hort. ex Steud., Nom. Bot., ed. 2, 2: 750, in syn. 1841. Verbena striata Vent. ex K. V. O. Dahlgren, Bot. Notiser Lund 1923: 10, sphalm. 1923. Verbena stricta L. ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena stricta Michx. ex Moldenke, Alph. List Invalid Names 50, in syn. 1942. Verbena strica Vent. ex G. L. Fisher, Am. Bot. Exchange List, sphalm. 1946. Verbena rugosa Michx. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947 [not V. rugosa D. Don, 1836, nor Mill., 1768, nor Muhl., 1809, nor Sweet, 1845]. Verbena stricata Vent. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena stricta x hastata Gates (in part) ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Verbena strieta Vent. ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947.

Verbenia stricta Vent. ex Moldenke, Alph. List Invalid Names Suppl. 1: 28, in syn. 1947. Verbena quintus Barkley, Nat. Mag. 50: [309], in jest. 1957. Veebena stricta Vent. ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960. Verbena stricta Benth. ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962. Verbena stricta Willd. ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962. Verbena stricta f. stricta Wallis ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962; Steyerm., Fl. Mo. 1260. 1963. Verbena hastata stricta Rydb. ex Moldenke, Résumé Suppl. 5: 10, in syn. 1962. Verbena structa Vent., in herb.

Bibliography: Vent., Descr. Pl. Jard. Cels. 53, pl. 53. 1800; Cav., Descr. 68. 1802; Michx., Fl. Bor.-Am., ed. 1, 2: 14. 1803; Vahl, Enum. Pl. 1: 207. 1804; Raf., Med. Repos. N. Y., ser. 2, 5: 360. 1808; Poir. in Lam., Encycl. Méth. Bot. 8: 549. 1808; Raf., Journ. Bot. [Paris] 1: 228. 1809; Mirbel, Ann. Mus. Hist. Nat. Paris 15: 260, pl. 14 (2), fig. 1. 1810; Dum. Cours., Bot. Cult., ed. 2, 2: 625—626. 1811; Pursh, Fl. Am. Sept. 2: 417. 1814; J. Sm. in Rees, Cycl. 36: no. 17. 1817; Sims in Curtis, Bot. Mag. 45: pl. 1976. 1818; Michx., Fl. Bor.-Am., ed. 2, 1 [=2]: 14. 1820; Steud., Nom. Bot., ed. 1, 874. 1821; Raf., First Cat. Bot. Gard. Transylv. Univ. 16. 1824; Spreng. in L., Syst. Veg., ed. 16, 2: 749. 1825; J. Torr., Ann. Lyc. N. Y. 2: 234. 1827; Sweet, Hort. Brit., ed. 2, 418. 1830; Raf., Atl. Journ. 1: 146. 1832; Raf., Herb. Raf. 61. 1833; Hook., Comp. Bot. Mag. 1: 176. 1836; Eaton & Wright, N. Am. Bot., ed. 8, 470. 1840; Steud., Nom. Bot., ed. 2, 2: 749 & 750. 1841; D. Dietr., Syn. Pl. 3: 602. 1843; Walp., Repert. 4: 23 & 33. 1845; Schau. in A. DC., Prodr. 11: 547 & 555. 1847; A. Gray, Syn. Fl. N. Am. 2 (1): 336. 1878; Pickering, Chron. Hist. Pl. 1044 & 1220. 1879; A. W. Chapm., Fl. South. U. S., ed. 2, 636. 1889; Wats. & Coult. in A. Gray, Man., ed. 6, 402. 1890; A. S. Hitchc., Trans. St. Louis Acad. Sci. 5: 512. 1891; Coult., Contrib. U. S. Nat. Herb. 2: 327. 1892; F. D. Bergen, Journ. Am. Folk-lore 5: 102. 1892; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; L. H. Bailey in A. Gray, Field Forest & Gard. Bot. 341. 1895; Hitchc. & Norton, Bull. Kans. Agric. Sta. 50: 54, pl. 6, fig. 91 (1895), 57: pl. 13, fig. 138 (1896), and 66: pl. 12, fig. 138. 1897; A. W. Chapm., Fl. South. U. S., ed. 3, 368. 1897; Hitchc. & Norton, Bull. Kans. Agric. Sta. 76: pl. 9, fig. 47. 1898; Britton & Br., Illustr. Fl., ed. 1, 3: 71, fig. 3061. 1898; A. S. Hitchc., Fl. Kans. pl. 14. 1899; N. L. Britton, Man. 778. 1900; J. K. Small, Fl. Southeast. U. S., ed. 1, 1009. 1903; Michx., Travels West Alleg., ed. Thwaite, 67. 1904; Robinson & Fern. in A. Gray, New Man. Bot., ed. 7, 689 & 924. 1908; M. A. Day, Check List 128. 1908; L. H. Pammel, Weeds Farm. & Gard. 218. 1911; Beal, Mich. Weeds [Bull. Mich. Agric. Exp. Sta. 267:] 396. 1911; Gerth van Wijk, Dict. Plantnames 1: 1398. 1911; Blewitt, Rhodora 13: 89. 1911; L. H. Bailey, Botany 372. 1911; Beal, Ann. Rep. Mich. Agric. Exp. Sta. 25: 385. 1912; Iowa Geol. Surv. Bull. 4: 265 & 469. 1913; Britton & Br., Illustr. Fl., ed. 2, 3:

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Illustrations: Vent., Descr. Pl. Jard. Cels. pl. 53. 1800; Mirbel, Ann. Mus. Hist. Nat. Paris 15: pl. 14 (2), fig. 1. 1810; Sims in Curtis, Bot. Mag. 45: pl. 1976 [in color]. 1818; Hitchc. & Norton, Bull. Kans. Agric. Sta. 50: pl. 6, fig. 91 (1895), 57: pl. 13, fig. 138 (1896), 66: pl. 12, fig. 138 (1897), and 76: pl. 9, fig. 47. 1898; Britton & Br., Illustr. Fl., ed. 1, 3: fig. 3061. 1898; L. H. Pammel, Weeds Farm & Gard. 218. 1911; Beal, Mich. Weeds [Bull. Mich. Agric. Exp. Sta. 267:] 396. 1911; Beal, Ann. Rep. Mich. Agric. Exp. Sta. 25: 385. 1912; Iowa Geol. Surv. Bull. 4: 265 & 469. 1913; Britton & Br., Illustr. Fl., ed. 2, 3: fig. 3556. 1913; Kanda, Bot. Gaz. 69: 66, fig. 61, 67, fig. 72, 70, fig. 42 & 45, & pl. 6, fig. 3. 1920; Dermen, Cytologia 7: 163, fig. 16. 1936; Gates, Weeds Kans. 91, fig. 19, pl. 6, fig. 91. 1941; Seed Trade Buyers Guide 86. 1945; Fern. in A. Gray, Man. Bot., ed. 8, fig. 1466. 1950; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 132. 1952; Hylander, Macmil. Wild Flow. Book pl. 166r [in color]. 1954; W. D. Barkley, Nat. Mag. 50: [309]. 1957; Strausbaugh & Core, Fl. W. Va. 3: 777. 1958; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 2, 132. 1958; H. V. Sm., Mich. Wildfls. pl. 155. 1961; Steyerm., Fl. Mo. pl. 302, fig. 4. 1963.

Downy or densely soft-pubescent erect perennial herb, occasionally very robust, sometimes several-stemmed from the base; stems herbaceous, relatively stout, erect, 0.2--2 m. tall, pale-colored, subterete, simple or corymbosely branched above, rather densely hirsute, pilose-hirsute, pale-pubescent, or canescent-hirsute throughout; roots perennial, elongate, often extending 1 m. or more down into the ground; leaves decussate-opposite or approximate, sessile or nearly so, pale-colored, the blades varying from ovate, oval, lanceolate, or oblong to elliptic, obovate, or suborbicular, thick-textured, 3--10 cm. long, usually quite broad, mostly acute at the apex, short-cuneate at the base or the lower ones often hastate-auriculate, sharply serrate or biserrate to incised or coarsely and acutely incised-serrate along the margins, hirsute and rugose above, strigose-hirsute or densely hirsute-villous beneath, prominently reticulate-venose beneath, the reticulation hirsute; inflorescence spicate, terminal; spikes long and thick, solitary or frequently clustered or corymbose-fasciculate, 30 cm. long or longer, short-pedunculate, cylindric, strict, stout, compact, usually quite densely-flowered and -fruited, strigose-hirsute throughout, the flowers imbricate; bractlets lanceolate-subulate or linear-setaceous, approximately as long as the calyx, ciliate, hirsute; calyx 4--5 mm. long, densely hirsute, its teeth short-acuminate; corolla hypocrateriform, varying from blue, dark-blue, deep-blue, bright-blue, mauvish-blue, violet-blue, or purplish-blue to purplish, purple, violet, or bright-violet, about twice as long as the calyx, its tube protruding slightly beyond the calyx, villous in the throat, pubescent or strigose-hirsute on the outside, the limb 8--9 mm. wide; fruiting calyxes and fruit crowded, overlapping, the cocci brownish, elongate, cylindric or ellipsoid, trigonous, about 2.5 mm. long, raised-reticulate above, strongly striate below, the commissural faces reaching the tip of the coccus, muriculate or almost smooth; chromosome number: $2n = 14$.

The species is based on a specimen cultivated in the Jacques Martin Cels nursery near Paris, France, in 1800, probably deposited in the herbarium of the Muséum National d'Histoire Naturelle in that city. The fact that the species is based on a cultivated plant indicates that it has been in cultivation at least as long ago as 1800. The type of V. alopecurus is a specimen cultivated in the Horto Botanico at Madrid, Spain, and deposited in the herbarium of the Jardin Botanico in that city, a phototype being deposited in the herbarium of the Missouri Botanical Garden at St. Louis. The type of V. mollis is said by Merrill (1949) to be the "Arkansas River?", that of V. ringens from "Kentucky", and that of V. cuneifolia from "Pa., Md., & Va." The name, V. hastata stricta Rydb., is apparently based on F. E. Clements s.n., collected in Nebraska in 1893 and deposited in the United States National Herbarium at Washington. The V. stricta x hastata Gates is in part also xV. moechina Moldenke and xV. rydbergii Moldenke; the V. scoparia of Hooker and of Gillies & Hooker are Diostea scoparia (Gill. & Hook.) Miers. The name V. quintus was proposed in jest by W. D. Barkley, illustrated by dorsal and ventral views of cocci of V. stricta with insect parts added and the legend "A rare prize is the verbena hardback, Verbena quintus, the male of which is the only known creature having an odd number of legs."

The "Verbena foliis ovato-oblongis, crenato-serratis ramisque pilosis" which Poiret accredits to Vahl, Enum. Pl. 1: 207, does not occur as a Verbena name in Vahl's book, but with "Stachytarpheta" as the first word is Vahl's description of his perfectly valid Stachytarpheta strigosa Vahl. Why Poiret shifted it to Verbena is not clear to me since he does not give Stachytarpheta strigosa as another synonym of Verbena stricta.

Poindexter (1962), in his comparison of V. stricta with V. hastata, xV. rydbergii, and xV. illicita, describes V. stricta as having a leaf-index of 1.3--2.1 (average 1.8); leaf-shape elliptic to ovate; leaf-base broadly attenuate to sessile; leaf-apex acute to rounded; stem pubescence hirsute; nutlet length 2.2--2.9 (average 2.6); markings on back of nutlet deeply ribbed; pollen fertility 50--100 percent (average 90 percent); corolla-tube length 4.5--5.5 (average 4.9); calyx length 2.8--5.1 (average 4.3); and petiole lateral vein measurement 3--6 (average 3.8). His data are apparently based, in part, at least, on the following of his collections, for all of which (except the second) he records a chromosome number of n= 7: Poindexter 37, 166-17 (pollen fertility 90 percent), 201-46 (91 percent), 207-27 (98 percent), 229-6 (98 percent), and 229-20 (73 percent). It should be noted here that Schwencke (1931) reports the haploid chromosome number as 6.

Walpers (1845) places V. stricta in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Micranthae, and Secondary Subgroup Holophyllae, with 22 other species.

The species has been collected in meadows and fields, old fields and dry fields, sandy or grassy fields and clover fields, waste fields and old eroded fields, open sandy fields, pastures and waste places, prairie and dry prairie or grassland pastures, dry or sandy-clay pastures, old or weedy pastures, dry open or rocky pastures, rocky or sandy prairie pastures, overgrazed or very rocky hilltop pastures, dry lowland or dry shortgrass prairie rangeland pastures, dry meadows, low or grassy meadows, woods and open woods, low oak-hickory woods, open wooded pastures, dry timber, open places and vacant lots, railroad yards and old Amerind graveyards, ditches and roadside ditches, creek bottoms and piney creek bottoms, draws and dry ponds, thickets, oak-elm woods and oak-hickory associations, openings of calcareous woodlands, dry streambeds and dry sandy valleys, moist places, high bottoms, and bottomlands, low wooded pond-margins, low sandy waste areas and sandy valley land, grasslands and dry grasslands, canyons and gravel-pits, cedar glades and barrens, gullies and dump-grounds, dry areas and dry places along railroads, and dune areas.

Collectors have encountered it in low marshy areas along creeks, prairie draws, bromegrass pastures mowed each summer, breaks of prairie with Asclepias, ravines and broad ravines, waste areas in old feed lots, pine forests as well as fields bordering creek woods, upland shortgrass and moderately grazed tallgrass prairies, eroded prairie ravines and low ravines in prairie pastures, grazed pastures on prairies, and the wet alluvium of floodplains.

It has been found growing in low or open dry ground, in open ground around shipyards, in low open ground, in dry or dry hard soil, dry soil along edge of cultivated fields, dry sandy and gravelly soil, sandy or sandy dry soil, dry sterile or waste soil, thin loam soil, clay soil with many rocks, disturbed gravelly or alluvial soil, chalky or red gypsum soil, clay and black clay soil, moist clay or sandy clay soil, hard clayish soil, and Plainfield Fine Sandy Loam soil, in very rolling heavy clay, black loam, sandy or clay loam, yellow fine sandy loam, clayey and gravelly calcareous loam, moist to dry loam, mesophytic sand loam, dry loam of roadsides, sand, dry sand, and limestone.

Collectors report is from prairies and plains, sand hills, sandstone hills, sand pits, dry calcareous loam on chalk cliffs, beaches and sand mounds, railroad embankments, and dry ballast along railroads. They have found it on roadside and rocky bluestem prairies, dry and alluvial prairies, sand and sandhill prairies, tallgrass and Liatris spicata prairies, buffalograss and limestone prairies, rolling or disturbed prairies, prairie bluffs and knobs, sandy plains and prairies, dry hills and dry sterile hillsides, dry or dry clay ridges, rocky arid or rocky prairie hillsides, prairie pasture hillsides, limestone slopes and ridges, rocky or sandstone ridges, the tops of escarpments, caliche outcrops, low rocky hills and ridges, dry open ridges and black oak sand ridges, sand dunes, low rocky clay or sand ridges, river bottoms, sandy or clay-loam bottoms, the tops of cliffs and rocky hilltops, dry roadside banks and open creek banks, dry banks and hillsides, floodplains, on sandy or rocky slopes and gravel terraces, sandy and rocky creek bottoms, sandy embankments and levees, the banks of artesian springs, on ballast and hardland, on bluffs and ledges, on rocks, at the edge of woods, the base of bluffs, the borders of roadsides, and at swale margins. It grows along roads and roadsides, dry or open roadsides, sandy or high prairie roadsides, the edges of ditches and small streams, the banks of small occasional streams, the borders of fields in floodplain woods, along irrigation ditches and river fronts or riverbanks, along railroads and railroad rights-of-way, the paths made by grazing livestock in bluegrass prairie pastures, and along streets and sandy roads.

Gates (1940) says that V. stricta grows in "Dry soils, valleys, thickets, and waste places" throughout Kansas "except southwest corner" and calls it a hemicryptophyte. Also in Kansas, McGregor refers to it as "common in low places in shortgrass pastures", "common in eroded prairie ravines", "common in low places", "common in moist area between sand dunes", and "common in dry sandy prairie ravines"; "abundant in disturbed areas of prairie hay meadows", "abundant in low ravines", and "abundant in low moist prairie pastures"; "mostly in ravines"; "scattered", "scattered in disturbed parts", "scattered in prairie ravines", and "scattered on prairie hillslopes"; "not common in dry overgrazed prairie pastures", and "not common in sandy pastures"; "large colonies in ravines in sandy prairie pastures", "large colonies in rocky prairie pasture ravines", and "very large extensive colony in overgrazed bluestem pasture". Lathrop found it on "roadside bank bordering a prairie pasture with limestone surfacing". Volle describes it as "prevalent in dry loam, grasslands and roadsides" and "common in woodland undergrowth". Marsh describes it as "common on prairie" and "common in Flint Hills limestone on rocky hilly prairies". Harms avers that it is abundant in ungrazed annually mowed prairies and "numerous though scattered in sandy loam". Unger states that it is "rare in sandy hummocks". Hulbert refers to it as "sparse in sandy loam pastures", while Wagenknecht found it in "upland bluestem pasture near large limestone outcrops", in "disturbed area in slightly overgrazed bluestem prairie", "common in large colonies in weedy overgrazed pasture along riverbanks", and a "common weed along edge of roadside ditches." Horr found it "scattered over [Trego] county in rich loam with fair soil moisture", "scattered all over [Meade] county in dry soil", "scattered in dry grassland, dry loam [Norton County]", "common in dry loam of overgrazed pastures [in Russell County]", and "common along roadside and waste land" in Coffey County.

In Illinois it is reported by Cranwill as "very common" in Jackson County and by McDonald as "abundant" in Peoria County, while Jones (1945) says of it "roadsides and fields, common. June-Sept." In Iowa it is described by Pammel as "a common weed in the Missouri loess, associated with Gaura coccinea, Chrysopsis villosa, and Heliopsis scabra" and "common in clearings, sandy clay soil associated with Asclepias verticillata, A. tuberosa, Coreopsis palmata, Heliopsis scabra, and Leptilon canadense", and "a common weed, sandy soil and pastures associated with V. bracteata, Plantago preslii, Delphinium penardi, and Viola pedata", and "common in sandy clay soil associated with Polygala sanguinea, Coreopsis palmata, Lespedeza capitata, Lepachys pinnata, and Parthenium integrifolium", and "common everywhere on gravel hills, sandy soil, throughout Iowa, a common weed in pastures". Pammel & Zimmerman report that it is "a common weed in sandy soil, knolls, and groves with Solidago missouriensis and V. bracteata", while Hayden describes it as "common on dry knolls".

Fawcett says that it is found "on barrens and prairies, Ohio to Dakota, south to Texas and New Mexico", while Muenscher says "Native from Ontario westward to the Rocky Mountains; sparingly introduced in the northeastern states".

In Texas it is found in pastures, prairies, and waste places, usually in dry soil, and on railroad embankments, blooming from June to September, mostly in the Blackland Prairies and Plains Country in southeastern Texas, from Lipscomb to Red River, Liberty, and Gonzales Counties. Cory calls it "abundant in flood plains" in that state, while Hennen reports it as scarce "in full sun" and Lynch says "infrequent to frequent in abandoned sterile fields". Clevender describes it as "common" in Platte County, Nebraska, while in Biol. Abstr. (1954) it is said to be an "invader of degenerate prairies" in that state, and Harms reports a "large colony in prairie" there.

Groh (1944) says of V. stricta: "Perennial. A weed in dry or gravelly soil" in Canada; Dodge says "becoming abundant in dry open ground" at Point Edward, Ontario, in 1911. In South Dakota it was found by Hayward along "streamsides with Salix, Quercus, Populus" and Harms describes it as "frequent in black loam of lightly grazed prairie" and "common in gravelly sandy loam on grazed prairie bluffs", while in Richland County, North Dakota, it is said by Stevens to be "common locally, but little farther". Cory found it to be "frequent in grassland bordering creek" in Oklahoma, while Robbins found it in "desiccated depressions along railroad rights-of-way". Ramaley calls it "ruderal" in Colorado, while Weber & Anderson refer to it there as a "weed along roadside".

In Wisconsin it was encountered by Ugent "in dry sandy soil with Opuntia", Arnot found it "in open dry roadside in former clay-soil prairie", Iltis & Neess call it "a weed at edge of highway", while Wills encountered it "on high sandstone bluff, north-facing densely wooded hillside". In the same state Iltis discovered it on a "very steep dry south- and southwest-facing Bouteloua-Andropogon goat prairie", while Iltis, Bell, Melchert, Patman, & Witton found it on "high granite cliffs, ledges, and pavement on exhumed red granite monadnocks" and Haggene, Melville, & Shaughnessy encountered it on "north-facing mixed hardwood hillside and limestone roadcut", Burton says "grassy field, appearing as a weed", Grether found it in "high goat prairie" and Heddle says that it grows "with Hedeoma hispida and Silene antirrhina in abandoned dry sand pit" and in "dry bluegrass pasture on south slope of rock ridge". Taylor reports it common on dry roadsides in that state.

In Missouri it is said by Bush to be "common in fields", by Marsh as "common along roadsides in cherty soil with limestone surfacing in oak-hickory woods", and by McGregor as "common in rocky open areas". Ewan found it in "rather deep sandy alluvium or river benchlands, full sun, among bushes back from the shore" in Colorado.

Monachino (1960) records the species from Bronx County, New York; Tatnall says that it is "well established in waste ground along rivers" in Delaware, while Earle found it in "waste ground around shipyard" in that state. Small s.n. [Sept. 25, 1891] from Lancaster County, Pennsylvania, bears a notation "introduced from west".

E. J. Palmer (1916) records his nos. 199, 675, and 2980 from Jasper County, Missouri. In his 1935 publication he states that the species inhabits "Prairies, thickets, glades, and waste ground. Circumneutral. General." Thorne (1955) calls it an "Abundant weed of overgrazed pastures, railroads, and other open places" in Iowa. Duncan (1950, 1953) records it from Douglas

County, Georgia. Lehr (1962) reports it from Rockland County, New York, where he notes that its predominant associates are Lobelia spicata and Rudbeckia serotina; Weber records his no. 1724 from Columbia County in the same state. Deam, Yuncker, & Friesner (1953) record it from DeKalb and Fountain Counties, Indiana, on the basis of F. A. Swink collections not as yet seen by me; in their 1947 work they record it from Huntington County; in their 1950 publication, from Orange County; and, with Kriebel (1945), from Delaware County. The "Porter" County, Iowa, record given for this species by me in my Résumé, page 18 (1959) is an error for Porter County, Indiana. Jones (1942) cites R. E. Shanks s.n. from Wood County, Ohio, while Braun (1943) records the species from Jessamine and Trigg Counties, Kentucky.

Steyermark (1963) records Verbena stricta from Andrew, Atchison, Bollinger, Buchanan, Butler, Caldwell, Cape Girardeau, Carroll, Carter, Cedar, Christian, Clark, Cole, Cooper, Dade, Dallas, DeKalb, Daviess, Dent, Douglas, Dunklin, Gasconade, Gentry, Harrison, Holt, Howard, Howell, Jefferson, Johnson, Laclede, Lafayette, Lawrence, Lewis, Linn, Livingston, Madison, McDonald, Mercer, Mississippi, Moniteau, Monroe, Montgomery, New Madrid, Newton, Oregon, Osage, Perry, Polk, Pulaski, Putnam, Ray, Ripley, Saint Clair, Saint Francis, Sainte Genevieve, Saline, Schuyler, Scott, Shannon, Shelby, Stoddard, Sullivan, Texas, Vernon, Washington, & Webster Counties, Missouri, on the basis of specimens preserved in the herbarium of the Missouri Botanical Garden at St. Louis, not as yet seen by me.

In general, I would say that this species grows from Ontario and Ohio to Minnesota, South Dakota, and Wyoming, south to Texas and New Mexico; introduced in the eastern and southeastern states and in Washington and Quebec. The specific name is sometimes uppercased for no valid reason. The plant has been collected in flower in January and from May to October, and in fruit from May to October and in December, at altitudes of 200 to 7300 feet, usually in full sunlight.

Material of Verbena stricta has been misidentified and distributed in herbaria under the names V. bractiosa Michx., V. canadensis Britton, V. diffusa Desf., V. hastata L., V. hastata x stricta Gates, V. lasiostachys Link, V. macdouglalii Heller, V. officinalis L., V. prostrata R. Br., and xV. rydbergii Moldenke, as well as Phyllanthus carolinensis Walt. (Euphorbiaceae), Stachys tenuifolia Willd. (Lamiaceae), Trianthema portulacastrum L. (Tetragoniaceae), Veronica arvensis L. and V. prostrata R. Br. (Scrophulariaceae).

On the other hand, the Over 14306 and Shear 149, distributed as V. stricta, are actually f. albiflora Wadmond; T. S. Brandegee s. n. [Providence Mts., May 26, 1902] is V. gooddingii Briq.; S. Williams 96 is V. halei Small; B. L. Wagenknecht 1927 is V. hastata L.; Rickett s.n. [Rockbridge, July 9, 1927] is xV. illicita Moldenke; H. S. Barber 152, M. E. Jones 6026 & 6054w, and Wooton 208 & s.n. [Mts. west of Grant's Station, August 1st, 1892] are V. macdougalii Heller; Demaree 29179 & 30963 and Favor s.n. [June 16, 1901] are xV. moechina Moldenke; Toumey s.n. [Sept. 17, 1894] is V. robusta Greene; Glatfelter s.n. [St. Louis, 6-3-92], Somes 3704, and B. L. Wagenknecht 3788 are xV. rydbergii Moldenke; F. C. Gates 3519 and H. W. Houghton 4032 are V. urticifolia L.; C. C. Albers 33013, Condit s.n. [Houston, June 19, 1909], Harding 172, and H. Ness s.n. [June 26, 1925] are V. xutha Lehm.; A. W. Chapman s.n. [1845] and R. K. Godfrey 4239 are Stylodon carneus (Medic.) Moldenke; and Porter 5150 is Salvia sylvestris L. (Lamiaceae).

Cinq-Mars s.n. [31 juillet 1951], A. S. Hitchcock s.n. [Ames, July '82], and Rydberg 1422 are mixtures with f. albiflora Wadmond; Kraeger 475 is a mixture with V. hastata var. scabra Moldenke; Demaree 29151 and L. H. Pammel s.n. [Hamilton, Sept. 8, 1918] & s.n. [Granite, Sept. 1, 1920] are mixtures with xV. rydbergii Moldenke; Z. Baldwin s.n. is a mixture with V. simplex Lehm.; and Schneck s.n. [Sept. 1, 1887] is a mixture with V. urticifolia L. The G. E. Morley 376 & 396, distributed as V. stricta with the comment "a very light color" of flower, are cited by me as f. roseiflora Benke, but may actually represent another undescribed color form corresponding to the f. caerulea Moldenke of V. hastata L.

Miss Gaiser says of her 1382aPE "scattered plants", of 1759PE "this population seemed to have generally less deeply lobed leaves", and of 2306PE "no hint of hybridization, just typical stricta in these sand hills along the beginning of lake toward Light House."

Schneck s.n. [July 25, 1897] has a spike fasciated at the apex; R. E. Shanks 1790 has rather slender spikes; C. R. Ball 2439 has two binary leaves; E. W. Fell 51309 has its leaves unusually narrow; E. Hall s.n. [Athens, Aug. 1863] bears the interesting notation "unadulterated". Demaree 30203 and F. J. Hermann 9159 are abnormal, somewhat resembling xV. rydbergii, but have the spikes heavily fruited so I am regarding them as V. stricta. Shimek s. n. [Oct. 14, 1919] was originally identified as "V. stricta x angustifolia"; A. E. Allen s.n. [Talmage, July 11, 1891], A. S. Hitchcock s.n. [Medicine L., July 1892], and J. L. Sheldon s.n. [Peru, July 21, 1900] were called "V. stricta x hastata"; W. H. Horr E.33 was distributed as "V. hastata x stricta"; L. H. Pammel s.n. [Comanche, Sept. 13, 1918] bears the ambiguous identification "V. stricta x spicata"; and Loomis s.n. [Alton, Oct. 1938], Muck 82, and S. V. Fraser 440 were cited as "V. stricta x hastata" in Gates, Kans. Fl. -- I regard all of these collections as typical Verbena stricta, as also R. Bebb 4376, originally thought by the collector to represent a cross with V. simplex Lehm.; H. N. Patterson s.n. [vicinity of Oquawka], labeled "Verbena stricta x bracteosa (Erect), very slightly mixed with V. bract. or is it hastata? or both?"; and the Herb. Hort. Bot. Basil. s.n. [1850] annotated by Perry as "possibly a garden hybrid".

On the other hand, Evers 198 may be a hybrid, since the tips of some of its spikes have the flowers distant. Deane s.n. [Medford, Nov. 13, 1887] consists of seeds only; S. F. Norton s.n. [June 27, '94] bears a notation averring that it was collected "at the exact center of continental U.S.A." The Herb. Calif. Acad. Sci. 31415 does not bear any indication on its label that it came from cultivated material, but I am assuming that it did. L. H. Pammel s.n. [Waseka, Aug. 1920] is marked "Wisc." on its label, but this locality is actually in Minnesota.

In my 1940 work I followed Perry in regarding V. stricta f. albiflora Wadmond and f. roseiflora Benke as synonymous with V. stricta, but I have since decided that these represent distinct and nomenclaturally worthy color forms. The C. M. Rowell 4115, cited below, is described by the collector as having had the corollas "lavender to pale purple" and so may possibly represent f. roseiflora. Davidson, Dixit, & Romberg 4689 is described as having had "flowers white and lavender" and is cited by me under f. albiflora. The corolla is described as "deep-blue" on Chamney 1, "blue" on Horr 4548, 4662, & 4767, "dark-blue" on McGregor 9367, "violet" on Marsh 1735, and "bright-violet" on Marsh 1613.

Bergen (1892) states that V. stricta is thought to be specific against fever and ague — hence the common name of "fever-weed". H. V. Smith (1961) claims that the plant shows rmarkable resistance to drought and "The foliage is so bitter that cattle will not eat it even when forage is scarce. The root system extends down more than a yard in dry soil, open sandy ground, in barren fields, along roads" in Michigan. Bailey (1935) states that its seeds are available to the horticultural trade from Rex D. Pearce.

The following fungi are known to attack V. stricta: Aecidium verbenae Auct. Amer. (non Speg.), A. verbenicola Ellis & Kellerm., Cercospora verbenae-strictae Peck, C. verbenicola Ellis & Ev., Dicaeoma verbenicola Arth., Erysiphe horridula Lév., E. lamprocarpa Auct. Amer. (in part), Phyllosticta verbenicola Martin, Puccinia sydowiana Diet., P. verbenicola Arth., P. vilfae Arth. & Holw., Septoria verbenae Rob., and Stagonospora verbenae Greene.

Mitchell (1960) and my son, Andrew Ralph Moldenke, report that the flowers of V. stricta are regularly visited by the bee, Calliopsis nebraskensis Crawford, the female taking pollen and nectar, the male taking only nectar.

Common and vernacular names recorded for V. stricta are "blue verbena", "blue vervain", "blue vervian", "bur-vine", "common vervain", "fever-weed", "hairy vervain", "hoary-leaved vervain", "hoary verbena", "hoary-verbena", "hoar vervain", "hoary vervain", "mullen-leafed vervain", "mullenleaf vervain", "mullen leaved verbena", "mullen leaved vervain", "mullen-leaved vervain", "purple vervain", "stout upright vervain", "thimble-weed", "upright vervain", "verbena", "vervain", "verveine", "verveine à tige droite", "wild hyssop", and "woolly verbena". It should be noted, however, that the names "verbena", "vervain", and "verveine" are applied to the genus as a whole and to many other species in it; "bur-vine" is applied also to V. simplex and V. urticifolia; "blue verbena", "blue vervain", and "wild hyssop" are applied also to V. hastata; "common vervain" is applied also to V. officinalis and V. urticifolia; and "thimble-weed" is applied also to Anemone virginiana L. (Ranunculaceae), Petalostemon purpureum (Vent.) Rydb. (Fabaceae), and Rudbeckia laciniata L. (Carduaceae).

Verbena stricta is known to hybridize freely -- the hybrid with V. bracteata Lag. & Rodr. is xV. deamii Moldenke, that with V. halei Small is xV. goodmani Moldenke, that with V. hastata L. is xV. rydbergii Moldenke, that with V. simplex Lehm. is xV. moechina Moldenke, and that with V. urticifolia L. is xV. illicita Moldenke.

George J. Goodman, in a letter to me dated October 24, 1960, states that Edw. Palmer 351 (re-numbered "243" by Torrey) was collected in Johnson County, Oklahoma, on June 25, 1868, and not from "the False Washita" or "Fort Arbuckle" as stated on the label.

Hooker (1836) cites T. Drummond s.n. [St. Louis] in the Kew herbarium. Schauer (1847) cites Riehl 196 and Engelmann s.n. from "In Americae septentr. austral. et austrooccidentalibus" in the DeCandolle Herbarium at Geneva, not as yet seen by me. Groh (1944) cites R. Cameron s.n. [Stamford, Welland Co., 1898], Dore & Groh 1805, Dore s.n. [N. of North Rideau, Carleton Co., 1943], Fisher s.n. [Sarnia, Lambton Co., 1902], Dent s.n. [Sarnia, Lambton Co., 1909], Montgomery 709 [Waterloo Co.], Owens s.n. [Toronto, York Co., 1944], Armstrong s.n. [Jermyn, Peterborough Co., 1903], and Scott s.n. [St. David's, Lincoln Co., 1898] from Ontario, and Dore s.n. [sandy pasture field, Danford Lake, Pontiac Co., 1931] from Quebec, not as yet seen by me.

Perry (1933) regarded f. roseiflora Benke and f. albiflora Wadmond as synonymous with V. stricta, but I regard them as distinct. She gives the distribution of the species as "eastern and central United States, from Pennsylvania westward through the Rocky Mountains. Probably introduced into other localities." She cites the following 120 specimens and 1 photograph not as yet seen by me: MASSACHUSETTS: Bristol Co.: Sanford s.n. [Fall River, 2 Sept. 1903] (G). CONNECTICUT: Fairfield Co.: E. H. Eames s.n. [Bridgeport, 27 Aug. 1892] (G). New Haven Co.: Blewitt 14 (G). NEW YORK: Tompkins

Co.: A. J. Eames 12797 (G). PENNSYLVANIA: Lancaster Co.: Urban s.n. [along Lincoln Highway at Gap] (G). OHIO: Montgomery Co.: Short s.n. [Dayton] (E). ILLINOIS: Hancock Co.: F. C. Gates 9994 (E). Henderson Co.: H. N. Patterson s.n. [Oquawka, 1872] (G). Jackson Co.: H. A. Gleason s.n. [Grand Tower, 22 Aug. 1900] (G). LaSalle Co.: Thone 88 (E). Macon Co.: H. A. Gleason 377 (G). Madison Co.: Sherff s.n. [Mississippi River, bluffs north of Alton, 4 Aug. 1910] (G). McLean Co.: Robinson s.n. [Bloomington, July 1886] (G). Menard Co.: E. Hall s.n. [Athens, Aug. 1863] (E). Pike Co.: J. Davis 16 (E), 6370 (E). Richland Co.: Ridgway 2431 (E). Saint Clair Co.: Eggert s.n. [E. St. Louis, 28 July 1900] (E). Will Co.: Umbach s.n. [Romeo, 26 July 1897] (E). Stony Island: H. H. Smith 5645 (E, G), 5952 (G), 6028 (E, G). INDIANA: Harrison Co.: C. C. Deam 20357a (G). Kosciusko Co.: C. C. Deam s.n. [northeast of Winona Lake, August 2, 1897] (E). Lake Co.: Lansing 2810 (G). IOWA: Cerro Gordo Co.: M. E. Jones s.n. [14 Aug. 1899] (E); L. H. Pammel 85 (E, G). Henry Co.: Ball 1585 (E). Van Buren Co.: Graves 1947 (E), 1994 (E). KENTUCKY: Ballard Co.: McFarland & Anderson 253 (E). MICHIGAN: Saint Joseph Co.: G. L. Fisher 19 (E). WISCONSIN: Dane Co.: Trelease s.n. [Oregon road, Madison, 29 July 1889] (E). Trempeleau Co.: Hale s.n. [Trempeleau, 1861] (G). Waupaca Co.: Garesche s.n. [Waupaca, 1907] (E). County undetermined: Eggert s.n. [Mirror Lake, 15 July 1903] (E). MINNESOTA: Hennepin Co.: Schuette s.n. [St. Anthony, July 7, 1888] (G). Houston Co.: Freiberg s.n. [July 1912] (E). Kandiyohi Co.: W. D. Frost s.n. [Willmar, July 1892] (G). Ottertail Co.: Chandonnet s.n. [Perham, August 8, 1912] (E). Wabasha Co.: Manning s.n. [Lake City, 28 July 1883] (G). SOUTH DAKOTA: Brookings Co.: Johnson s.n. [Windsor Township, 27 July 1903] (E). Jackson Co.: E. J. Palmer 37627 (E, G). Lawrence Co.: W. P. Carr 118 (E, G). Roberts Co.: Over 14386 (W). Sanborn Co.: Visher 4450 (E). KANSAS: Hamilton Co.: C. H. Thompson 154 (E, G). Montgomery Co.: Rydberg & Imler 433 (E). Osborne Co.: Shear 191 (G). Pottawatomie Co.: A. S. Hitchcock 972 (W). Riley Co.: J. B. S. Norton 391 (E, G). MISSOURI: Benton Co.: Trelease 717 (E). Camden Co.: Emig 107 (E). Clay Co.: K. K. Mackenzie 261 (E). Jackson Co.: B. F. Bush 475 (E). Jasper Co.: E. J. Palmer 199 (E), 2980 (E); Trelease 718 (E). Lincoln Co.: Beckwith 48 (E). Marion Co.: J. Davis 1202 (E), 1513 (E), 2791 (E), 2960 (E), 2962 (E), 3227 (E), 3589 (E), 4461 (E), 4487 (E). Phelps Co.: Kellogg 498 (E). Saint Louis Co.: Letterman s.n. [Allenton](E); Redfield 522 (E). Taney Co.: B. F. Bush 570 (E). Wayne Co.: E. J. Palmer 6107 (E). Wright Co.: Lansing 3164 (G). Saint Louis: Engelmann s.n. [St. Louis, Aug. 1841] (G); Riehl 196 (E). ARKANSAS: Craighead Co.: Demaree 3553 (E). Washington Co.: F. L. Harvey 61 (E). County undetermined: F. L. Harvey s.n. [Curtiss 1958] (G). MONTANA: Big Horn Co.: Blankinship s.n. [Crow Agency, July 14, 1901] (G). WYOMING: Laramie Co.: A. Nelson 538 (G). Platte Co.: A. Nelson 505 (E, G). COLORADO: Denver Co.: Eastwood 90 (E, G). Yuma Co.: Eggleston 15224 (E). NEBRASKA: Custer Co.: Bates s.n. [Callaway, 27 June 1901] (G); L. H. Pammel s.n. [Broken Bow, 7 July 1897] (E). Harlan Co.: L. H. Pammel s.n. [Alma, June 21, 1897] (E). Lancaster Co.: Webber s. n. [Lincoln, 27 June 1885] (E). Lincoln Co.: H. Engelmann s.n. [South Fork of the Platte, July 1856] (E, G). Merrick Co.: A. A. Heller 14290 (E). Thomas Co.: Rydberg 1422, in part [Dismal River south of Thedford, 27 June 1893] (G). OKLAHOMA: Choctaw Co.: H. W. Houghton s.n. [Stevens 4000] (E, G). Cleveland Co.: Emig 365 (E). Comanche Co.: M. K. Clemens 11748 (E); G. W. Stevens 1354 1/2 (E, G). Ellis Co.: G. W. Stevens 2930 (G). Greer Co.: G. W. Stevens 1034 (G). Harper Co.: Stratton 403 (E). Kay Co.: G. W. Stevens 1865 (G). Murray Co.: Emig 787 (E). Pawnee Co.: Stratton 249 (E). Rogers Co.: B. F. Bush 435 (E). TEXAS: Dallas Co.: J. Reverchon 735 (E), s.n. [Dallas] (G). Hemphill Co.: Eggert s.n. [near Canadian, 11 Aug. 1900] (E). NEW MEXICO: Santa Fe Co.: Fendler 597, in part (D, G). WASHINGTON: Stevens Co.: Kreager 475, in part (G). CULTIVATED: Spain: Herb. Bot. Gard. Madrid s.n. (E--photo). The Bain 328, Bush 475, Rydberg 1422, and Small s.n. which she cites from "NY" are actually in the Columbia University herbarium; what she cites as "Harvey 1958" from "NY" is herein cited as Harvey s.n. [Curtiss 1958] in the Columbia University herbarium; her Reverchon s.n. from Dallas at "NY" is probably the J. Reverchon s.n. [Dallas, May 1877] in the Barnard College herbarium; her Jones s.n. from Grinnell, "Aug. 1877", is probably the "Aug. 8, 1877" collection cited below; and what she cites as "Houghton 4000" is listed by me as Houghton s.n. [Stevens 4000]. Of V. stricta she says "A very distinct species somewhat incapable of sharp delimitation on account of the tendency to hybridize with neighboring species. Normally it is recognized by its stout compact spike, imbricated flowers, and ovate-orbicular sessile leaves."

In all, 1916 herbarium specimens and 2 mounted illustrations have been examined by me.

Citations: QUEBEC: Deux-Montagnes Co.: Cinq-Mars s.n. [31 juillet 1951] (Mg, Vi); Cléonique-Joseph 11964 (Vi); Louis-Marie s.n. [27 juillet 1937] (Ca--8494); Major-Barnebé 1031 (Vi). Pontiac Co.: Lamarre s.n. [Onslow Corners, 7 août 1951] (S). ONTARIO: Huron Co.: Marie-Victorin, Rolland-Germain, & Dominique 45993 (Um--207). Lambton Co.: J. Dearness s.n. [Pt. Edward, 13th August 1902] (Mg); C. K. Dodge s.n. [Point Edward, July 27, 1902] (Mi, Mi), s.n. [8/27/10] (Ob--87659), s.n. [Point Edward, July 11, 1911] (Mi), s.n. [Point Edward, 8/27/40] (Au, Au); G. L. Fisher s.n. [Sarnia, Aug. 5, 1902] (B); Gaiser 1382aPE (Gp, Gp, Gp, Mm), 1618PE (Gp, Gp, Gp, Mm), 1759PE (Gp, Gp, Gp, Mm), 2178PE (Gp, Gp, Gp, Mm), 2306PE (Gp, Gp, Gp, Mm); Gaiser & Montgomery 2234PE (Gp); Gaiser & Slobasky 1382 (Gp, Gp, Gp, Gp, Mm). Middlesex Co.: Colgrove s.n. [Strathroy, 31 Aug. 1934] (Mg). MASSACHUSETTS: Middlesex Co.: Deane s.n. [Medford, Nov. 13, 1887] (Ba). CONNECTICUT: Fairfield Co.: E. H. Eames s.n. [Bridgeport, VIII.27.1892] (N, W--283608). Litchfield Co.: E. H. Eames 10221 (In). NEW YORK: Albany Co.: H. D. House 18369 (Al). Cattaraugus Co.: M. Zimmerman s.n. [Red House, Aug. 8, 1935] (Ba). Columbia Co.: W. A. Weber 1724 (Bl--48174). Queens Co.: Monachino 94 (Bt--35373, Dp, H--40674, I, Io--145159, N, N, Ok, Ur). Rockland Co.: Lehr 1034 (N). Suffolk Co.: Disbrow s.n. [E. Hamp., 1894] (Nm). Tompkins Co.: A. J. Eames 12797 (S); Muenscher & Bechtel 463 (Ba, Gg--31421, Io--112276, Pl--63267). Ulster Co.: Elting 2073 (Al). Warren Co.: H. D. House 28901 (Al). Washington Co.: Carpenter s.n. [Granville, Aug. 1911] (Vt); Pember s.n. [Granville, Aug. 4, 1911] (Vt), s.n. [23 Aug. 1911] (Al). NEW JERSEY: Hudson Co.: Van Sickle s.n. [New Durham, July 15, 1893] (Tc, W--309648), s.n. [Granton, Sept. 21, 1895] (W--243275). Morris Co.: Monachino 462 (Ec, Jr, Ml, N), s.n. [Budd Lake, Sept. 17, 1939] (N). PENNSYLVANIA: Allegheny Co.: Bright s.n. [Aug. 27, 1922] (Cm, Cm); B. H. Patterson s.n. [Sept. 2, 1918] (Cm, Cm, Cm). Lancaster Co.: A. A. Heller 638 (W), s.n. [Conewago, Sept. 27, 1901] (W--407055); J. K. Small 106 (Ob--50840), s.n. [vicinity of Dillerville, July 25, 1890] (Up--17126, W--298654), s.n. [Conewago, August 30, 1890] (Io--20756), s.n. [Sept. 25, 1891] (C), s.n. [vicinity of Conewago, September 1892] (C). Philadelphia Co.: Eckfeldt s.n [June 20, 1913] (Up). Westmoreland Co.: Shafer s.n. [July 19, 1900] (Cm), s.n. [July 20, 1900] (Cm). Presque Isle: Ammons, Strausbaugh, & Bartholomew s.n. [Presque Isle, July 29, 1940] (We). DELAWARE: New Castle Co.: E. Tatnall s.n. [July 1881] (Pa). Sussex Co.: E. C. Earle 1781 (Ca--6869, Up); J. H. Holmes 242 1/2 (Ka); R. R. Tatnall 3122 (Up). WEST VIRGINIA: Pocahontas Co.: Herb. West Va. Univ. Bot. Exped. 1081 (We, We, We). NORTH CAROLINA: Onslow Co.: Ahles 599 (Ur). ALABAMA: Cullman Co.: C. Mohr s.n. [Cullman, May 29, 1892] (W--771847). OHIO: Butler Co.: Miller & Roth s.n. [July 15, 1932] (Ob--80600). Champaign Co.: T. Draper A.157 [Herb. Leonard 6400] (W--2161893); E. C. Leonard 17267 (W--1601267). Clark Co.: Black 36-7098 (Be--47803). Hamilton Co.: Aiken 10691 (Ll), s.n. [Terrace Park, VII-25-1905] (Po--267631); E. L. Braun s.n. [7/25/05] (Cn, Cn), s.n. [Terrace Park, Aug. 9, '17] (Cn), s.n. [Terrace Park, Aug. 19] (Cn); J. Clark s.

n. [Cincinnati] (Bm); Collector undesignated s.n. (Cn); C. J. Herrick s.n. [Aug. 24, 1889] (Ob--80601); M. Mohr 467 (Ll). Lake Co.: H. C. Beardslee s.n. [June 2nd, 1870] (Ob--80599). Montgomery Co.: G. S. Graves s.n. [12 August 1880] (Al); E. C. Leonard 2440 [Herb. Leonard 4382] (W--2161775); Leonard & Mannakee 5552 [Herb. Leonard 4393] (W--2161861); H. P. Smith 1958 (Dt). Sandusky Co.: Moseley s.n. [Gibsonburg, Aug. 9, 1920] (Mi). Union Co.: A. R. Moldenke 794 (Lw). Wood Co.: Moseley s.n. [Bowling Green, June 12, 1921] (Mi, Mi); R. E. Shanks 1790 (N). County undetermined: J. L. James s.n. (Du--9544); Jewett s.n. [July 12, 1842] (Mi); C. G. Lloyd s.n. (Ll). ILLINOIS: Adams Co.: Brinker 1222 (Il--15905), 2691 (Il--15805), 2729 (Il--15907); E. W. Erlanson 18 (Mi); Evers 197 (Il--25583, N), 198 (Ur), 1446 (Ur); Evers, Jones, & Jones 646 (Ur); A. B. Seymour s.n. [Camp Point, 1 Aug. 1876] (H--106464), s.n. [Adams Co., 1882] (H--106465). Bureau Co.: Congdon s.n. [Princeton, Oct. 1856] (Du--9545); Winterringer 7995 (Il--37248). Carroll Co.: Ahles 4312 (Ur); Collector undesignated s.n. (Il--15871); G. D. Fuller 1747 (Il--15802); Winterringer 8145 (Il--37437). Cass Co.: Ahles 2949 (Ur); G. D. Fuller 11855 (Il--24789); F. C. Gates 551 (Mi); Winterringer 5077 (Il--35517). Champaign Co.: M. H. Bell 161 (Ur); L. J. Blake s.n. [Urbana, 7-15-51] (Ur); R. Crane 1773 (N); Evers 1485 (Ur), 1487 (Ur); H. A. Gleason s.n. [Champaign, July 31, 1900] (In); F. W. Johnson s.n. [Longwood] (N); G. N. Jones 12436 (Au, Ur), 12523 (Il--15808, N, Ur), 12525 (N), 12667 (Il--15807, N, Ur), 15265 (Ur); Piesbergen s.n. [July 2, 1942] (Ur); Seymour & Waite s.n. (Ur--17465); Stubbs 7 (We); Waite s.n. (Ur--29662); Winterringer 4014 (Il--29329). Christian Co.: De Mott s.n. [Taylorville, 8/15/'96] (Ur); Shouse s.n. [July 21, 1950] (Ur). Coles Co.: V. A. Anderson 12594 (Il--20713); G. D. Fuller 10643 (Il--21731, Il--21732). Cook Co.: H. H. Babcock 9283 (Bz--23790), s.n. [Hyde Park, July 3, 1811] (N), s.n. [Chicago, July 3, 1871] (W--310735), s.n. [July 2, 1874] (Sg--16102, W--71941), s.n. [Chicago] (Al); L. H. Bailey s.n. [Chicago, July 27, 1880] (Ba); S. A. Cain s.n. [Aug. 1926] (Bt--2464), s.n. [southern Chicago, 1926] (Bt--2473); M. A. Chase s.n. [Cicero, July 20, 1896] (Ur, Ur); M. H. Clark s.n. [Lincoln Park, July '69] (Mi); Davis & Davis 1635 (We); Dixon & Gage 752 (W--609434); H. S. Fawcett s.n. [Berwyn, 8-25-03] (Io--73684); G. D. Fuller 1312 (Il--15793); Gilman s.n. [Chicago, July '69] (Pr); Roman s.n. [13/9/1893] (S), s.n. [Aug. 1893] (S); Shipman 1358 (Mi); Umbach 5914 (Ca--441527, Ka--62531); Wessén 787 (Go, S), s.n. [Jackson Park, VII.1899] (Gg). DeKalb Co.: P. B. Whitford s.n. [July 19, 1946] (Ur). DeWitt Co.: Winterringer 6766 (Il--34402). Douglas Co.: Winterringer 612 (Ur). Fulton Co.:

Winterringer 8832 (Il--38672). Hancock Co.: F. C. Gates 9994 (Ur); Kirchherr 66 (Il--15917); Kirchherr & Fuller 46 (Il--15803); Mead s.n. [August 1845] (N); L. H. Pammel s.n. [Hamilton, Sept. 8, 1918] (Io--94058). Henderson Co.: H. N. Patterson s.n. [July 1872] (Al), s.n. [near Oquawka, August 1872] (N), s.n. [August 14, 1873] (Al), s.n. [Oquawka] (Cm), s.n. [vicinity of Oquawka] (W--1323124, W--1323125). Henry Co.: Stark s.n. [Orion, July 16/23] (Dp). Jackson Co.: Cranwill s.n. [July 17, 1917] (Ur); Fuller & Welch 915 (Il--15893); J. McCree 915 (Ur). Jasper Co.: Shearer s.n. [9/1/1928] (Ur). Jersey Co.: P. Jacobs 68 (Ur). Jo Daviess Co.: Ahles 4363 (Ur); Winterringer 8148 (Il--37434). Kane Co.: Pearsall 7279 (Il--15806). Kankakee Co.: Collector undesignated s.n. [July 8, 1870] (Ur, Ur). Lake Co.: Earll s.n. [Waukegan, June 1878] (W--491442); F. C. Gates 3160 (Ur). LaSalle Co.: G. D. Fuller 2299 (Il--15798); H. K. Henry 122 (Up); McDougall 45 (Ur); Thone 88 (Ur). Lawrence Co.: Sivert s.n. [June 23, 1949] (Il--31977), s.n. [June 26, 1952] (Ur). Lee Co.: G. D. Fuller 11928 (Il--18896); Keithley 129 (Il--15790), s.n. [June 29, 1943] (Ur); Lyman s.n. [Amboy, 1896] (Dt); Mertz 251 (Cm), s.n. [Dixon, Aug. 14, '77] (Bc), s.n. [Dixon, Aug. 15, 1877] (N). Livingston Co.: G. D. Fuller 9194 (Il--15914); H. N. Moldenke 7607 (N). Logan Co.: Ahles 4044 (Ur); G. Randolph s.n. [July 17, 1959] (St). Macon Co.: H. A. Gleason s.n. [Je. 19, 1896] (Ur); H. N. Moldenke 21909 (Lw, Ut, Z); Winterringer 6502 (Il--33798), 6683 (Il--34267). Macoupin Co.: W. E. Andrews s.n. [June 20, 1889] (Ur); G. D. Fuller 2246 (Il--15799). Madison Co.: Norwood s.n. [July 4, 1948] (Ur). Marion Co.: M. S. Bebb s.n. [Salem] (T). Mason Co.: G. D. Fuller 2243 (Il--15895); H. A. Gleason 9223 (N); G. N. Jones 22383 (Ur); Winterringer 481 (Ur), 514 (Ur). Massac [& Pope] Co.: Whiting 1725 (Il--15800). McDonough Co.: E. R. Boardman s.n. [Prairie] (Go); C. H. Kauffman 458 (Mi); G. N. Jones 22401 (Ur); R. M. Myers C.15 (Il--23944). McHenry Co.: H. R. Bennett s.n. [August 10, 1957] (Go); Mason s.n. [Algonquin, July 27, 1878] (Ur); Vasey s.n. [Ringwood] (Pa). McLean Co.: Calef 545 (Ur); G. D. Fuller 187 (Il--15796). Menard Co.: E. Hall s.n. [1861] (Ur), s.n. [Athens, Aug. 1863] (Pa). Montgomery Co.: Winterringer 3849 (Il--29265). Morgan Co.: E. Epling 6423 (La); A. R. Moldenke 826 (Lw); E. S. Steele s.n. [about 1880] (Ob--50831). Moultrie Co.: Winterringer 4870 (Il--34908). Ogle Co.: Ahles 4547 (Ur); A. L. Hills 3392-0 (Il--15892, Ur). Peoria Co.: V. H. Chase 4585 (Ur); M. Fisher s.n. [9-3-1880] (Ka); Heading s.n. [July 1875] (Ur), s.n. [July 18, 1884] (No--25224); F. E. McDonald s.n. [Peoria, May 1887] (Hi--59473), s.n. [Peoria, July 1901] (Ur), s.n. [Peoria, July 1903] (Io--76181, N); Umbach s.n. [July 26, 1897] (N). Piatt Co.:

Ahles 3356 (Ur); F. C. Gates 2125 (W--649182); G. N. Jones 20814 (Ur); R. Pearson s.n. [July 24, 1949] (Ur); A. B. Seymour s.n. [Deland, September 1889] (H--10772). Pike Co.: J. Davis 16 (Ur), 3239 (Vi), s.n. [Shepherd, 25-6-15] (Ur); A. R. Moldenke 835 (Lw). Rock Island Co.: E. T. Harper s.n. [Port Byron, 1893] (Io--133475). Saint Clair Co.: E. W. Andrews 1539 (Ur); J. Neill 291 (Il--22978). Sangamon Co.: Ahles 4590 (Ur); G. D. Fuller 1366 (Il--15791), 4194 (Il--15797), 4276 (Il--15896), 4499 (Il--15902), 4590 (Il--15906), 4613 (Il--15910), 4660 (Il--15911), 4700 (Il--15885), 4742 (Il--15904), 4799 (Il--15886), 4821 (Il--15782), 4880 (Il--15912), 4948 (Il--15888), 5024 (Il--15897), 5066 (Il--15908), 5117 (Il--15783), 5144 (Il--15889), 5195 (Il--15887), 5244 (Il--15898), 5348 (Il--15787), 5470 (Il--15786), 5571 (Il--15788), 5591 (Il--15918), 5654 (Il--15909), 5691 (Il--15780), 5845 (Il--15890), 5881 (Il--15784), 5974 (Il--15785), 6006 (Il--15899), 6098 (Il--15891), 6319 (Il--15781), 6385 (Il--15789), 8792 (Il--15913); L. B. Mead s.n. (Ca--216738); A. R. Moldenke 823 (Lw); A. B. Seymour s.n. [Springfield Junction, 8 July 1879] (H--106464). Scott Co.: A. Flynn 14239 (Il--25153); A. R. Moldenke 831 (Lw, Ut). Shelby Co.: G. D. Fuller 13090 (Il--23753). Stark Co.: V. H. Chase s.n. [July 10, 1896] (Ur, Ur). Stevenson Co.: Serf 9833 (Il--15915), 9869 (Il--15916). Tazewell Co.: V. H. Chase 4174 (Ur). Union Co.: Collector undesignated s.n. [Aug. 1, 1879] (Cm); G. D. Fuller 667 (Ur); Fuller & Fisher 667 (Il--15795). Vermilion Co.: Storm s.n. [July 28, 1949] (Ur, Ur); Winterringer 6520 (Il--33773). Wabash Co.: Schneck s.n. [Sept. 1, 1887] (Ur), s.n. [July 25, 1897] (Ur), s.n. [July 1900] (Ur); Shearer s.n. [Mt. Carmel, July 6, 1900] (Vi). Whiteside Co.: Ahles 4211 (Ur); G. D. Fuller 13662 (Il--31212); Winterringer 8167 (Il--37438). Will Co.: Umbach s.n. [Romeo, Aug. 25, 1897] (Mi, W--339480). Winnebago Co.: M. S. Bebb 9285 (Bz--23789), s.n. [Fountaindale, 1867] (Cm); E. W. Fell 51309 (Il--38606), 51327 (Il--38588), 51340 (Il--38616), 52660 (Il--38883); Fuller & Haime 15f (Il--15792), 2179h (Il--15894); W. H. Rhoades s.n. [Rockford] (Hs); Swezey s.n. [Pecatonica] (Gg--31416). Woodford Co.: V. H. Chase 9693 (Ur), 9963 (Ur), 9990 (Au--122715, St, Ur, Ur). Stony Island: H. H. Smith 5645 (Ca--882826), 6028 (Ca--882825). County undetermined: H. H. Babcock s.n. [Aug. '69] (Br); M. S. Bebb s.n. [Central Illinois, 1867] (Bm); J. Blake s.n. [Illinois] (S); Buckley s.n. [1837] (T); Collector undesignated s.n. (Gg--31414); Fink s.n. [Blackberry, July 28, 1892] (Io--28699); Short s.n. [Dry prairies] (T); J. Torrey s.n. [Illinois] (Pr); G. R. Vasey 4 (Il--16006), s.n. (Ms). INDIANA: Carroll Co.: C. C. Deam 15345 (In). Clay Co.: W. M.

Rhoades s.n. [Spencer, July 1931] (Up). Daviess Co.: Tewell s.n. [Washington, 19 June 1936] (Fl--25879). Elkhart Co.: C. C. Deam 21001 (In); Friesner 15874 (Bt--54747). Floyd Co.: C. C. Deam 41547 (In). Fulton Co.: C. C. Deam 42167 (In); Friesner 13655 (Bt--46926). Gibson Co.: C. C. Deam 25506 (In); Schneck s.n. [July 1888] (In). Greene Co.: C. C. Deam 25657 (In); Friesner 6513 (Bt--14217); Kramer & Johnson s.n. [July 16, 1941] (Ok); W. Rhoades s.n. [near Marco, July 1927] (Bt--29294, N). Hamilton Co.: Friesner 6043 (Bt--13455, Ca--540466, Lb--13646, Po--201415, Sd--23983). Harrison Co.: C. C. Deam 20357a (In), 41498 (In). Hendricks Co.: S. M. Deam 13675 (In). Howard Co.: Ek s.n. [7-9-1938] (Bt--56734). Jasper Co.: C. C. Deam 42088 (In); Friesner 14611 (Bt--50862); Welch s.n. (In--5838, In--5839). Jefferson Co.: J. M. Coulter 14 (Vt). Jennings Co.: C. C. Deam 11253 (In); Hendricks s.n. [August 7, 1941] (Hi--24737). Knox Co.: C. C. Deam 29283 (In); Friesner 7923 (Bt--20358, Gg--237861, H--27372); S. McCoy 630 (Dp--4674), 4233 (Lb--43727). Kosciusko Co.: C. C. Deam s.n. [northeast of Winona Lake, August 2, 1897] (In, W--493309); Friesner 15436 (Bt--54877). Lagrange Co.: C. C. Deam 14980 (In), 31309 (In); Friesner 15621 (Bt--54608). Lake Co.: R. Bebb 1682 (Ok); F. W. Johnson 348 (N); Lansing 2810 (W--753094). LaPorte Co.: C. C. Deam 31426 (In). Lawrence Co.: Kriebel s.n. [7-3-33] (Bt--19475); Weatherwax s.n. (In--2404); Wynn 89 (Au). Marion Co.: H. H. Bartlett s.n. [July 13, 1903] (Mi); C. C. Deam 6957 (In); H. F. Dietz s.n. [Fall, 1910] (Du--9542); Friesner 16956 (Bt--62249, St--23607, We), s.n. [Pleasant Run & Brookville Rd., 7-1-25] (Bt--2471). Marshall Co.: C. C. Deam 45070 (In); Evermann 970 (W--357804); W. H. Rhoades s.n. [Plymouth] (Hs); Scovell & Clark 970 [35] (Du--9538). Martin Co.: C. C. Deam 11383 (In). Miami Co.: Ek s.n. [near Bunker Hill, 8-16-1936] (Bt--42529). Monroe Co.: V. Davis s.n. [Bloomington] (In--2287); Lewis & Brown s.n. [Bloomington, Aug. '06] (Au). Montgomery Co.: C. C. Deam 17621 (In). Newton Co.: C. C. Deam 18108 (In); Friesner 14703 (Bt--50598, Ky, N, Pl--132318, We); H. Hahn s.n. [Roselawn, 1905] (W--609230); M. McKee 1404 (Dp). Owen Co.: S. M. Deam 8952 (In); W. H. Rhoades s.n. [Spencer, July 1931] (Hs, N), s.n. [near Spencer, July 1931] (N); Weatherwax s.n. [Spencer] (In--1042). Parke Co.: Daubenmire s.n. [7/7/30] (Bt--6068); Disbrow s.n. [Silverwood, Sep. '03] (Nm); W. H. Duncan 194 (H--2494). Pike Co.: C. C. Deam 16965 (In). Porter Co.: C. C. Deam 31560 (In); F. W. Johnson 348 (N); Tryon 1519 (H--103045). Posey Co.: S. A. Cain 484 (No--31721); C. C. Deam 16813 (In); W. H. Welch 6929 (Bl--42346, Ca--892820, Dp--14547, We). Pulaski Co.: Friesner 22373

(Au—122723, N, Ok, S). Putnam Co.: Banker 1361 (N); S. M. Deam 13490 (In); Friesner 7105 (Bt—14854); Grimes 164 (Dp); McDougal s.n. [7-30-89] (Dp, Dp); Yuncker 3677 (Dp). Saint Joseph Co.: C. C. Deam 49230 (In). Starke Co.: C. C. Deam 17954 (In), 31835 (In); Friesner 16311.5 (Bt—56415); W. H. Rhoades s.n. [near Knox] (Hs). Steuben Co.: C. C. Deam 54226 (Dm). Sullivan Co.: Craw s. n. [July 4, 1930] (Bt—5283); C. C. Deam 7307 (In). Tippecanoe Co.: Cummins s.n. [Battleground, July 2, 1936] (Ah); C. C. Deam 17689 (In); Dorner 102 (Pu), 248 (Pu), s.n. [near Lafayette, 1900] (In); Ek s.n. [8-1-1940] (Bt—56621); Erisman s.n. [LaFayette, Aug. 25, '94] (Ah); Foster s.n. [Wea Bottoms, 10/17/01] (Pu). Tipton Co.: Ek s.n. [8-5-1942] (Bt—64498). Vermillion Co.: C. C. Deam 11946 (In). Vigo Co.: C. C. Deam 25762 (In); Friesner 6666 (Bt—14461, Bt—14525); Mohr & Mohr s.n. [Terrehaut, 1884] (W—771851). Wabash Co.: C. C. Deam 53985 (Dm). Warren Co.: C. C. Deam 9740 (In), 11903 (N); Friesner 11014 (Bt—38616). Wayne Co.: Creek 160 (Ea); C. C. Deam 13585 (In); L. J. King 1663 (Ea), 1664 (Ea), 2620 (Ea); "M. B." 156 (Ea). White Co.: C. C. Deam 39359 (In). County undetermined: Dorner s.n. [9/28/99] (Ur); A. Wood s.n. [Ind.] (Pa). IOWA: Adair Co.: A. R. Moldenke 937 (Lw); H. N. Moldenke 21939 (Lw). Adams Co.: Dunn & Isely 5707 (W—2099962). Allamakee Co.: L. H. Pammel s.n. [New Albin, Aug. 6, 1918] (Io—94219); Shimek s.n. [Aug. 13, 1917] (Ur); Tolstead s.n. [Hanover Twp., July 15, 1933] (Ca—882818), s.n. [Hanover Twp., Aug. 9, 1933] (Io—144282). Appanoose Co.: L. H. Pammel s.n. [Moravia, Oct. 1914] (Io). Benton Co.: A. R. Moldenke 977 (Lw). Black Hawk Co.: Burk 527 (Ur); L. H. Pammel 673 (Io—119243), s.n. [Cedar Falls, Aug. 13, 1908] (Io—78234). Boone Co.: Collector undesignated s.n. [Aug. 1937] (La); J. V. Ellis 155 (Io—54363). Carroll Co.: L. H. Pammel s.n. [Coon Rapids, June 26, 1921] (Io—99924). Cass Co.: A. R. Moldenke 934 (Lw). Cedar Co.: Fay 688 (Hi—123798), 852 (Ca—965065), 970 (Vi). Cerro Gordo Co.: A. Hayden 1, in part (N), s.n. [October 15, 1934] (N); L. H. Pammel s.n. [Willow Cr., Sept. 20-23, 1902] (Io—28203). Cherokee Co.: L. H. Pammel s.n. [Cherokee, IX.5.1920] (Io—98223). Chickasaw Co.: L. H. Pammel s.n. [Lawler, July 1919] (Io—94013). Clarke Co.: Pammel & Pammel s.n. [Osceola, Sept. 26, '24] (Io—114346). Clay Co.: A. Hayden 3005 (Io—149006), 3007 (Io—148885); W. A. Weber 1272 (Bl—48176). Clayton Co.: A. R. Moldenke 991 (Lw); Pammel & Pammel s.n. [McGregor, Aug. 1924] (Io—114871). Clinton Co.: L. H. Pammel s.n. [Comanche, Sept. 13, 1918] (Io—95170), s. n. [Dewitt, Sept. 10, 1924] (Io—114397). Dallas Co.: L. H. Pammel s.n. [Dawson, Aug. 16, 1918] (Io—95628). Decatur Co.: J. P. Anderson s.n. [July 11, 1903] (Io—52108). Delaware Co.: A. R.

Moldenke 987 (Lw). Des Moines Co.: L. H. Pammel 735 (Io--118882), 961 (Io--119553). Dickinson Co.: W. B. Fox 7 (We); Gier s.n. [June 21, 1952] (Je--7173); Mrs. L. Jones s.n. [June 24, 1928] (Ob--83155); Pammel & Pammel s.n. [Arnold's Park, 7-23-13] (Io--73719); C. M. Roberts s.n. [Spirit Lake, Aug. 1920] (Io--97107), s.n. [5/25/23] (Cm). Emmet Co.: Cratty s.n. [13 July 1886] (Ob--50835), s.n. [Armstrong, August] (Io--92218); W. H. Welch 9700 (Au--122739). Fayette Co.: Fink 251 [July 12, 1894] (W--214893), 251 [Sept. 4, 1894] (W--214893), s.n. [Fayette, 7-18-1894] (Io--26816, Io--31575); J. R. Gardner 583 (N). Floyd Co.: Arthur s.n. [Charles City, July 13, 1872] (Ah), s.n. [Charles City, July 16, 1872] (Ah), s.n. [Charles City, 7/15/74] (Ah). Fremont Co.: Deer s.n. [southwest corner of the state, Aug. 1934] (Cm); L. H. Pammel 704 (Io--119300), s.n. [Hamburg, Jul. 14, 1923] (Io--111220); W. H. Rhoades s.n. [Hamburg, Aug. 1928] (Hs). Greene Co.: L. H. Pammel s.n. [Jefferson, June 26, 1921] (Io--95859). Hamilton Co.: L. H. Pammel s.n. [Stratford, Jul. 13, '24] (Io--115186); Pammel & Zimmerman 306 (Io--119090). Harrison Co.: Collector undesignated s.n. [Dunlap, July 1925] (Nj); Fay 3714 (Vi); L. Kellogg s.n. [Halsted's Am. Weeds 174] (Ah, C, Fc, Io--15352, Mi, Ua--11397, Ur, Vt, We); Rigg s.n. [June23, 1898] (Se--14954). Humboldt Co.: Hask s.n. [Humboldt, May 21, 1902] (Io--22917). Iowa Co.: Easterley 729 (We); A. R. Moldenke 972 (Lw). Jasper Co.: Elrod s.n. [Prairie City, July 7, '85] (Mn--18071). Jefferson Co.: L. H. Pammel s.n. [Fairfield, Sept. 1919] (Io--95191). Johnson Co.: Loufek s.n. [June 1938] (Io--147639, N); McConaha s.n. [August 1935] (Bt--39041); Somes 3489 (W--672272). Kossuth Co.: E. B. Watson s.n. [Algona, 9-5-02] (Io--74134). Lee Co.: R. A. Davidson 2269 (W--2235821); Fults 1089 (Io--138822); Shimek s.n. [July 15, 1928] (Ur). Linn Co.: A. R. Moldenke 980 (Lw). Louisa Co.: R. A. Davidson 858 (W--2261035); L. H. Pammel s.n. [Fredonia, June 1927] (Io--129476). Lyon Co.: C. R. Ball s.n. [Little Rock, June 30, 1897] (Io--15325); L. H. Pammel s.n. [Granite, Sept. 1, 1920] (Io--97830); Shimek s.n. [Aug. 26, 1910] (N). Madison Co.: A. R. Moldenke 940 (Lw). Marion Co.: A. R. Moldenke 956 (Lw). Mehaska Co.: Augustine 261 (Ok); A. R. Moldenke 957 (Lw). Mills Co.: Fay 3593 (Hi--126891); A. R. Moldenke 924 (Lw, Ut, Z). Mitchell Co.: Tuttle 31a (Io--74177). Monona Co.: L. H. Pammel s.n. [Onawa, Jul. 13, 1923] (Io--109650). Muscatine Co.: Estle & Brown s.n. [south of Muscatine, summer 1935] (Io--146363); L. H. Pammel s.n. [Jul. 20, 1919] (Io--95283); Shimek s.n. [Oct. 14, 1919] (Ur). O'Brien Co.: Yuncker & Welch 4110 (Dp). Palo Alto Co.: Cratty s.n. [West Bend, Jul. 10, 1919] (Io--96078); W. A. Weber 1261 (Bl--48175, Io--150767). Polk Co.: Bakke s.n. [Des Moines, 9-21-12] (Io--